

chemical processing

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Putman Publishing Company/Creators of Putman-Style
EXECUTIVE MAGAZINES FOR INDUSTRY

THE WHITING FIRE

Mobile radio proved vital communications link

See Safety Section



Chemistry's Most Reactive Compounds...

B&A ELEMENTAL FLUORINE and HALOGEN FLUORIDES

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B&A HALOGEN FLUORIDES

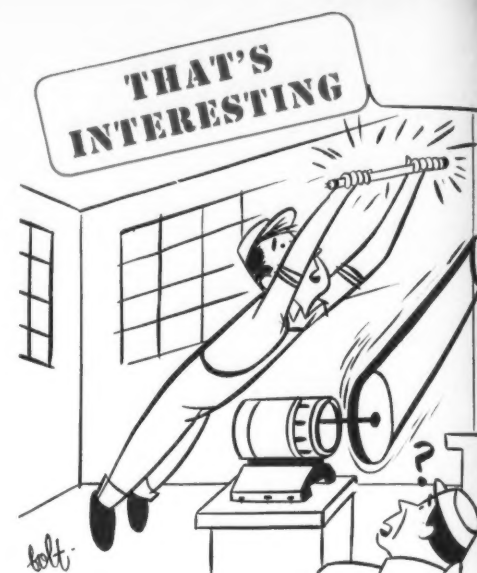
	Chlorine Trifluoride	Bromine Trifluoride	Bromine Pentafluoride	Iodine Pentafluoride
Melting Point	-76.32°C	8.8°C	-62.5°C	9.6°C
Boiling Point	11.75°C	125.75°C	40.3°C	97°C

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GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION
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When inquiring check CP 2337 opposite last page



"Get quite a charge on a dry day, eh, Smythe?"

Static electricity appears in new light

The subject of static electricity around V-belts has had some new light shed upon it by researchers at Dayton Rubber Company. They recommend holding a 1/25th-watt neon glow bulb near a V-belt to check for potentially dangerous static electricity.

The bulb lights if there is static electricity around the belt. Dry days are the most troublesome. There may even be enough static generated to knock the bulb out of your hand — some kind of holder is recommended.

Tiny instrument saves planes and pilots

If the rockets carried by combat aircraft are faultily fired or improperly released, plane and pilot are in great danger. A rocket burning in the stowage compartment of some fighter planes can do so for only 300 milliseconds without creating untold damage.

A new device — so tiny it can be held in the palm of the hand — now monitors the rocket compartment. It can detect and eject improperly released or faultily-fired rockets in half a thousandth of a second... with safety to plane and pilot.

Tablet-within-a-tablet machine

Tablets with a "raincoat" — compressed from dry powder around the core tablet of the active ingredient — can be made at relatively high speed (up to 500 per min) by a unit recently announced by F. J. Stokes Machine Co. of Philadelphia.

Machine makes it possible to sugar-coat penicillin, or to protectively coat other active ingredients.

Such dry-coated tablets don't have to be compressed so hard, and thus disintegrate more rapidly when swallowed.

(Continued on page 227)

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 18 December, 1955 No. 12

Serving more than 45,000 circulation in these industries:

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OTHER SUBSCRIPTIONS: 75 cents the copy; \$9.00 the year. Accepted as Controlled Circulation publication at Mendota, Illinois. Publication office: 1501 W. Washington Road, Mendota, Illinois. Address all correspondence to Editorial and Executive office, 111 East Delaware Place, Chicago 11, Illinois.

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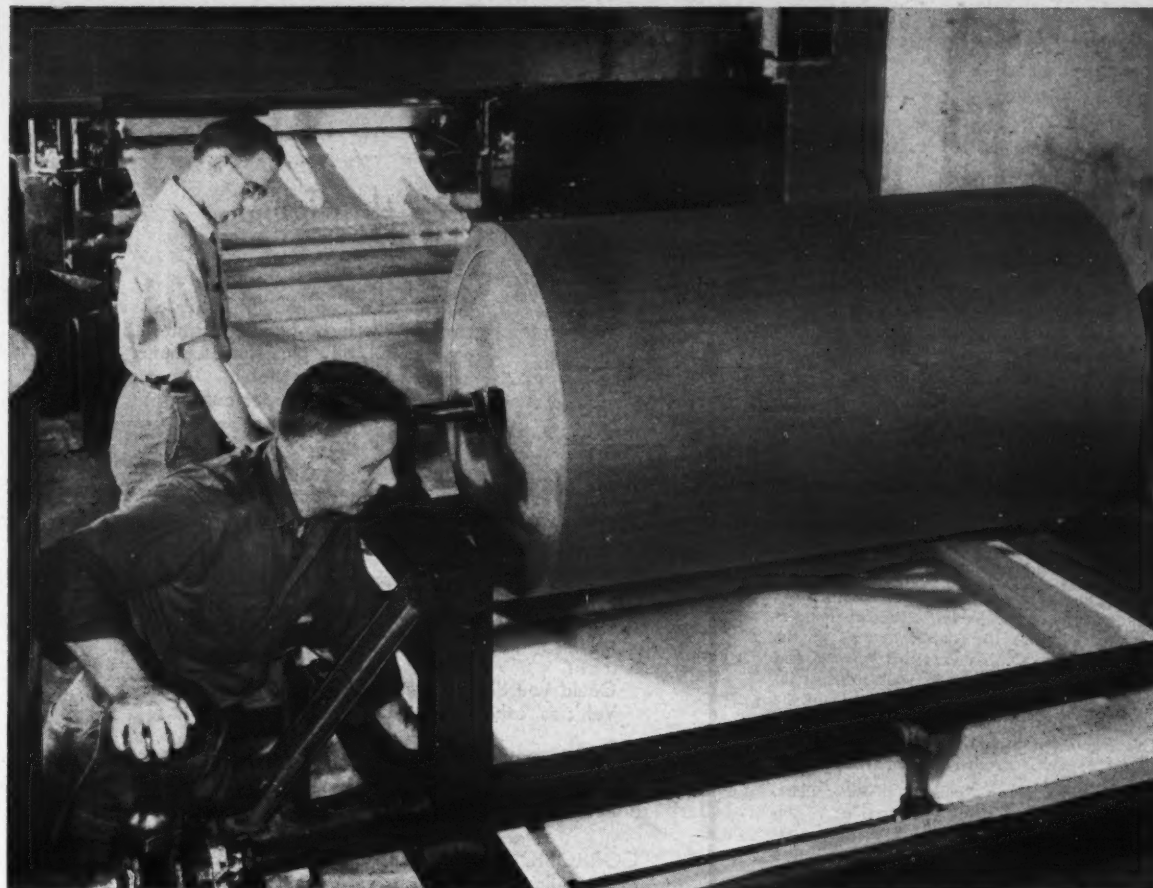
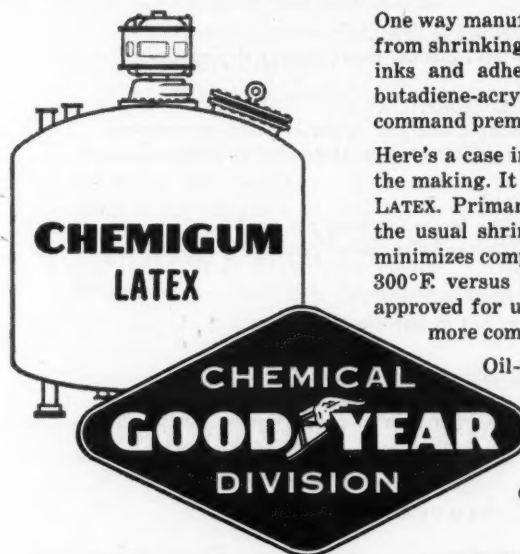


Photo courtesy The Carlock Packing Company, Palmyra, N. Y.

Sure way to keep profits from shrinking



One way manufacturers of paper, textile and leather goods can keep profits from shrinking is to use CHEMIGUM LATEX in coatings, sizes, impregnants, inks and adhesives. CHEMIGUM LATEX is an aqueous dispersion of a butadiene-acrylonitrile copolymer which imparts premium properties that command premium prices.

Here's a case in point: Above you see a new kind of gasketing material in the making. It consists of a cork paper base impregnated with CHEMIGUM LATEX. Primary advantages over conventional gasketing are: 1. It ends the usual shrinkage of gaskets in storage or in service against water—minimizes complaints and their effect on profits. 2. It withstands heat up to 300°F versus the usual 212°F. 3. It fully resists gasoline and oil— is approved for use with hazardous liquids. 4. It is stronger, more resilient, more compressible.

Oil-, grease- and solvent-resistance, washability, wearability, strength, flexibility, drape, feel, adhesion and aging are some of the general properties of your product that may well be improved by CHEMIGUM LATEX. Why not protect or improve your profits by writing for details to: Goodyear, Chemical Division, Dept. L-9435, Akron 16, Ohio

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When inquiring check CP 2338 opposite last page



Over
the editor's
shoulder

How do you read CP?

We editors enjoy talking to you as we visit your plants. You help us plot the course of our editorial columns by your helpful comments — both pro and con. Sometimes we find places where we can help a reader to "get more" out of **CHEMICAL PROCESSING** by clarifying our editorial philosophy and method of presentation.

For example, some of our readers haven't quite caught on to the fact that each issue is sectionalized into the "job interests" of the processing man. This means that you can find reports on developments in your primary interests quickly, by turning immediately to the sections which pertain directly to your work. Later, you can flash through the rest of the pages for news of other developments.

Four sections are a "must" for all readers. They represent a sort of "cross-section" of job interests. The "New Solutions" section consists of stories telling how a plant solved a problem, be it in processing, packaging, material handling, corrosion, instrumentation, etc. The "Idea" section brings you details of developments in research and in fields other than chemical processing, which may be useful in commercial production in the fields we serve.

"Processing & Engineering Data" (or just plain "Engineering Data") consists of clip-out pages of nomographs, charts, and tables to help you in your calculations. Finally, there's the "New Literature" section, packed with short items about new bulletins, booklets, and catalogs available to you.

You'll find these four sections and the other "more specific" sections listed in the table of contents on this page every month.

Dana B. Berg

MANAGING EDITOR

• For more information on articles and advertisements in this issue, check the Reader Service slip opp. last page

• The product directory, pages 218 to 220, is your guide to all articles and advertisements

• To subscribe to this magazine, see reader-qualification form opp. last page

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THIS MONTH'S COVER

CHEMICAL PROCESSING'S cover this month shows flaming storage tanks at Standard Oil's Whiting, Ind., refinery. Story on page 68 tells how mobile radio provided dependable communications . . . prevented even greater loss. (Chicago Tribune photo)



Dec 5-7. Chemical Specialties Manufacturers Association, Annual Meeting, Roosevelt Hotel, New York City.

Dec 5-9. 25th Exposition of Chemical Industries, Commercial Museum and Convention Hall, Philadelphia.

Dec 6-7. The Society of the Plastics Industry, Inc., Sixth Film, Sheet, and Coated Fabrics Division Conference, Hotel Commodore, New York City.

Dec 10-16. International Atomic Exposition and Nuclear Engineering and Science Congress, Public Auditorium, Cleveland.

Dec 12-13. The Material Handling Institute, Inc., Annual Meeting, Statler Hotel, New York City.

Dec 12-14. American Pharmaceutical Manufacturers Association, Mid-year and Eastern Section Meetings, Waldorf-Astoria Hotel, New York City.

Jan 18-20. Society of Plastics Engineers, 12th Annual Conference, Hotel Statler, Cleveland.

Jan 23-26. Plant Maintenance and Engineering Show, Convention Hall, Philadelphia.

Jan 23-27. American Standards Association, Gaillard Seminar on Industrial Standardization, New York City.

Jan 24. National Association of Purchasing Agents, Chemical and Allied Products Buyers' Group, Mid-Western Meeting, Palmer House, Chicago.

Jan 31. NAPA, Chemical and Allied Products Buyers' Group, Eastern Meeting, Hotel Commodore, New York City.

Feb 1-2. Chemical Market Research Association, Meeting on Aromatic Chemicals, Pittsburgh.

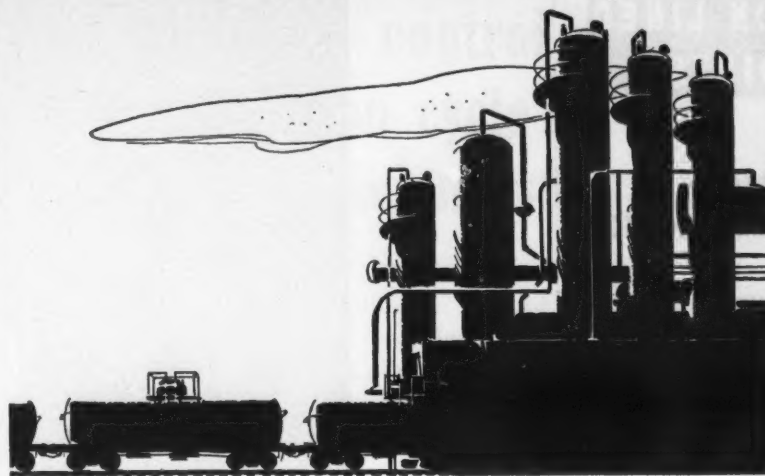
Feb 26-29. American Institute of Chemical Engineers, Statler Hotel, Los Angeles.

Apr 9-12. American Management Association, 25th National Packaging Exposition, Convention Hall, Atlantic City.

Apr 18-20. Armour Research Foundation of Illinois Institute of Technology, Industrial Research Conference on "Research for Profit", Illinois Tech Campus, Chicago.

Apr 26-27. American Institute of Electrical Engineers, National Meeting, Bradford Hotel, Boston.

Apr. 29-30. The Electrochemical Society, Inc., Mark Hopkins Hotel, San Francisco.



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Glycols, Dichloride
Ethanolamines
Nonyl Phenol
Morpholine
Ethylene, Propylene
and Glycerine
Carbonates
Polyethylene Glycols

Briefs

from Recent Literature

Ethanolamine

Efficacious ink removers may be prepared for general use by incorporating a polyethylene-glycol base with an ink solubilizing or decolorizing material such as the triethanolamine and oxalic acid salt having only one free or unneutralized carboxyl group; i.e., the triethanolamine acid oxalate.

Dyeing of cellulose acetate or other esters of cellulose textile materials with indigoid vat dyes, giving textile materials fast to light, to acid fading and substantially free from crocking, may be done by impregnating a dried dyestuff material with an aqueous solution of sodium sulf-oxylate formaldehyde and 5-10% by weight of diethanolamine.

A compound of triethanolamine and a dibasic acid combined with a triethanolamine fatty-acid salt provides an improved antistatic composition. Artificial staple fibers treated with it can be carded and spun without generation of static electricity. The dibasic acid salt is incorporated in amounts ranging from 0.5 to 2 parts for each part of fatty acid salt. This mixture is applied as an aqueous solution in such a manner that the fibers retain 0.5 to 1.5% of its weight of the alkanolamine-dibasic acid salt.

Sulfides present a costly problem in the corrosion of ferrous metals in oil wells. A means is now at hand to reduce corrosive action by removing the sulfides from solution. The mixture, into corrosive liquids, of the fatty-acid derivative of an alkanolamine provides good protection. In laboratory testing, mild steel coupons were exposed to a 50-50 mixture of crude oil and brine. Corrosion rates of the coupons in the untreated mixture were compared with coupons in the same mixture which had been treated with 0.005 to 0.01 volume % of various fatty triethanolamine derivatives. Reduction in corrosion rates of 85% to 99% was achieved.

These developments are abstracted from recent publications or U. S. patents. They may suggest applications of Ethanolamines in your products or processes. Permission to practice inventions covered by unexpired patents can be given only by the owners thereof. Jefferson's products are offered with the understanding that the user will make his own tests to determine their suitability for his purpose.

When inquiring check CP 2339 opposite last page

DORE'S NEW TEFLON LINED EXPANSION JOINTS

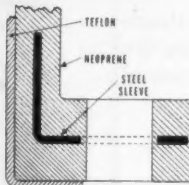


**WITHSTAND
TEMPERATURES TO
425°F.
PRESSURES TO
150 P.S.I.**

Extensive tests by Doré prove that unsupported TEFLON Bellows and Expansion Joints are not successful at temperatures above 150°F. — pressures over 50 p.s.i.

To overcome this problem, Doré has developed, and recommends, expansion joints and bellows of Neoprene or high temperature rubber lined with TEFLON. Thus supported, TEFLON can be successfully used at higher temperatures and pressures.

An L-shaped steel sleeve imbedded in the duck and Neoprene prevents distortion of the flange, transmits pressures directly to the TEFLON extending over flange face to assure a flange-to-flange seal that defies leaks.



This new combination gives you a leak-proof bellows that incorporates the advantages of TEFLON with the pressure-and-temperature resistant advantages of Neoprene or high temperature rubber.

THERE IS A BELLWS AND EXPANSION JOINT TO FIT YOUR REQUIREMENTS.

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Style E-8-N

150 p.s.i. - 250°F. Sizes 1" through 20"

TEFLON Lined Neoprene Expansion Joint
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TEFLON Lined Rubber Expansion Joint
Style E-8-NT

150 p.s.i. — 425°F. Sizes 1" through 20"

TEFLON Lined Neoprene Bellows
Style E-8-NM

100 p.s.i. — 150°F. Sizes 1" through 20"

TEFLON Lined Rubber Bellows
Style E-8-NMT

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"See our exhibit at the 25th Exposition of Chemical Industries"
Commercial Museum, Philadelphia, Pa. December 5 to 9, 1955

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Karsh, Ottawa

there is nothing to fear — from automation

These pertinent remarks on automation are from a talk, "Our One Indispensable Weapon", given at the Annual Dinner of The Greater Johnstown Chamber of Commerce, Johnstown, Pennsylvania, February 11, 1955.

BENJAMIN F. FAIRLESS

Director and Former Chairman of the Board
United States Steel Corporation

- ▶ "Automation" has become a menacing word — a modern bogey-man to frighten people
- ▶ There is nothing new about automation except the word itself — it is simply evolution
- ▶ Only through use of new and better machines can we hope to achieve the fullest employment and a higher living standard
- ▶ Our one indispensable weapon in this time of crisis is our technology — our salvation lies in its growth and change

Recently, there has appeared in this country a great propaganda campaign clearly calculated to discourage and retard the technological progress on which our freedom and the safety of our homes depend. This campaign is based wholly on the psychology of fear. It is designed to frighten our people into the belief that the new machines being developed now will destroy the jobs of thousands of workers and leave them destitute. And, unfortunately, it appears that this propaganda is proving effective both in the ranks and in the leadership of labor.

Now, there is nothing new, of course, about man's fear of machines. It has existed throughout the

Our Guest Editor this month, Mr. Benjamin F. Fairless, has had so long and distinguished a career in the steel industry that limitations of space prevent even the briefest of biographical sketches. Suffice it to say that, from humble beginnings, he rose to become Chairman of the Board of the United States Steel Corporation in 1953.

Mr. Fairless recently retired as chairman, but remains with USS as a member of the board and of the finance committee. He has also been made chairman of the newly-formed executive advisory committee of the board of directors.

ages. You'll recall that about twenty-five or thirty years ago such fears were prevalent here in the United States.

In those days, one of the popular plays on Broadway was called "R.U.R.", and it brought the word "robot" into our language. That word frightened us for quite awhile. Technological unemployment became the subject of national debate. But the American people refused to accept this fatal philosophy of fear. This was fortunate indeed, because most military experts now agree that the decisive battles of World War II were fought and won on the production lines of American industry.

Yet today, the same old blind, unreasoning fear of machines is reappearing among us; and the most curious thing about this new campaign of propaganda is that we are being frightened — not by the advance of technology itself — but once again by a strange new word that few of us understand. This time the word is "automation" instead of "robot", but it means just about the same thing.

Among the engineers who coined it, the word automation is merely a term which conveniently describes certain mechanical controls and processes. There is nothing frightening about it, nor is there anything basically new about the mechanical principles to which it applies.

But to thousands of people who do not understand its meaning, it suggests a brand new class of machines — different from any which we have ever had before — and so superior to man that, ultimately, they may rise, like Frankenstein's monster, to destroy us all. Thus, the word alone is enough to conjure up visions of a wholly automatic factory where machines with super-brains will grind out products, 168 hours a week, without any human payroll whatever.

These fears, of course, are just plain silly. There are no such machines and no such factories; nor will there ever be in our time! But propaganda is a powerful thing and it is growing louder.

(Continued on page 217)

now you can control your filtration cycle for peak efficiency

The Bird-Prayon Filter's individual pans, coupled with flexible application of feed and wash, pin point the feed slurry and wash liquors at the correct positions in the filtration cycle.

This flexibility means

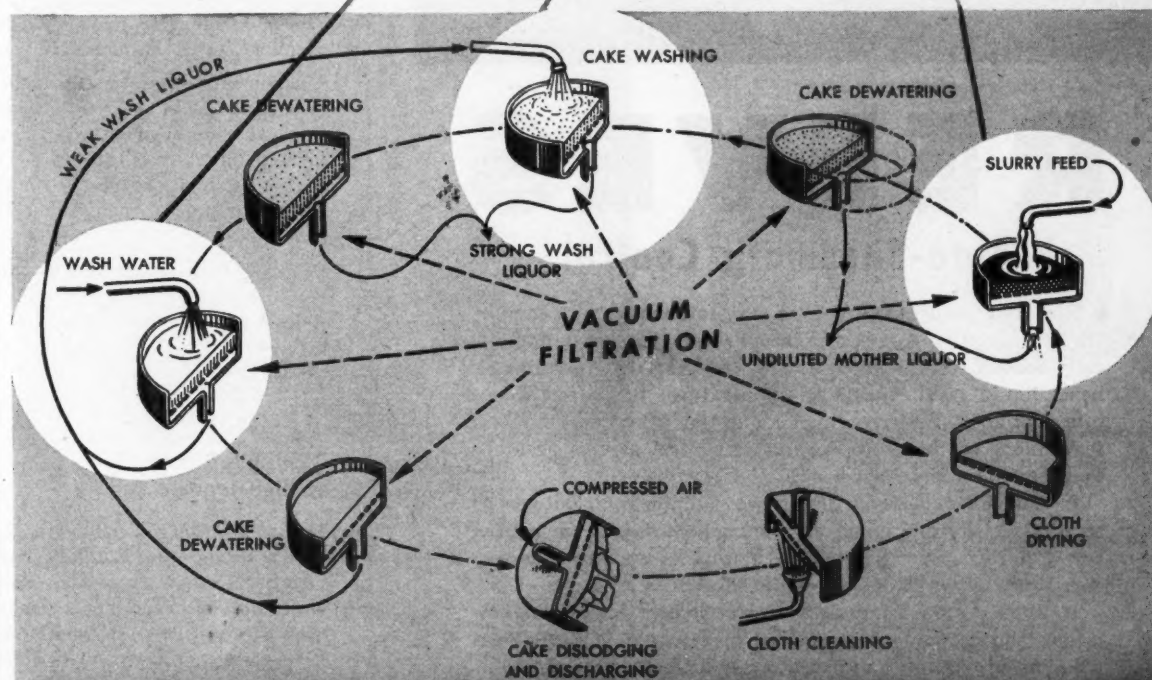
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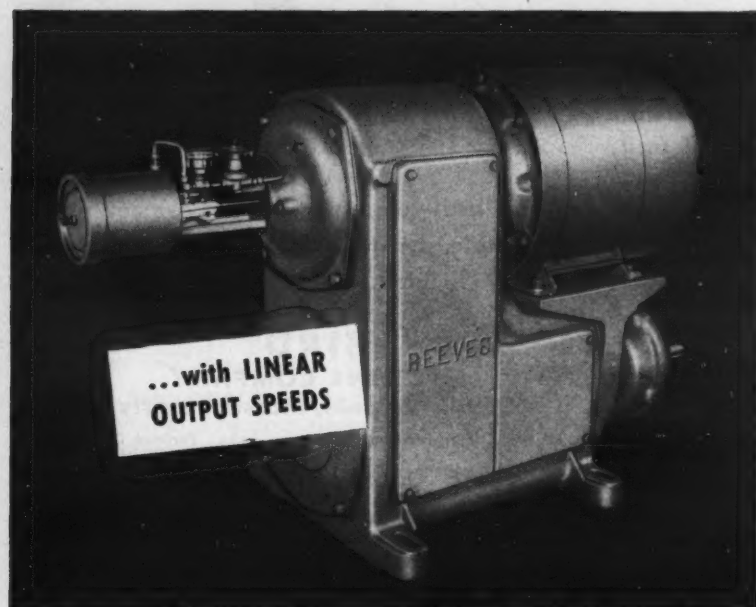


This Sketch Brings out One of the Many Advantages of the

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New Automatic Speed Control for Continuous Processing



REEVES

Auto-Pneumatic Control

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When inquiring check CP 2342 opposite last page



*what you can expect in
next month's issue . . .*

Gremlin chasing in a power station



A dozen or so "war surplus" gremlins invaded the Ripley station of Kansas Gas & Electric Company in 1950. High pH of cooling water was leading to fungus attack in redwood cooling towers. When station engineers tried to beat this problem they ran into another . . . and another. The gremlins stayed on top until early 1954.

Gremlin chaser turned out to be a novel system of adding sulfuric acid and controlling pH automatically . . . within 0.1 pH unit. Method assures maintenance of proper pH — not high enough for fungus to take hold again, not low enough for metal equipment attack.

Working with information obtained from KGE chemical engineer Earl S. Kennedy, Associate Editor Bruce Fader gives blow-by-blow account in a January "New Solutions" feature.

Trapping fine dusts at high temps

The plant manager fighting air pollution has a strong ally in filters made from Fiberfrax ceramic fibers. The "Ideas" opening feature next month tells results of AEC tests on the filters, showing they remove 99% of micron-size particles from exhaust gases. Even more eye-opening: temperatures of 1400°F (and probably up to 2000°F) won't harm the filter or impair operation.

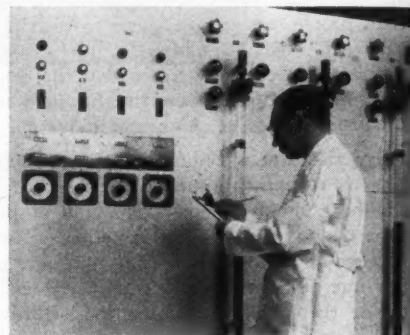
Teflon for 600°F

Next month's "Corrosion Control" feature article uncovers a new inorganic-fiber-reinforced Teflon that resists cold flow, heat distortion, and extrusion at temperatures to

600°F. At the same time, material retains most of the resistance to chemicals that Teflon can boast about. According to reports, it's proving itself now as gasket material, valve seats, guide bushings.

Customer service 24 hours a day

National Aluminate Corporation, Chicago, has applied automation to the solving of customer ion exchange problems in its test labs. Automatic cycle control has permitted



around-the-clock operation of the test columns with direct supervision for only eight hours of the day. Fast answers to customer problems are the result.

Working with A. Fradkin of Nalco's Ion Exchange Division, CP Assistant Editor Bill Clarke wrote story on the set-up — a "New Solutions" highlight next month.

Acrolein session

Photo (top next page) shows R. W. Eddy (center) and Dr. T. J. Hall (right), both of Carbide and Carbon Chemicals' Fine Chemicals Division, discussing the company's new acrolein chemicals . . . while CP Assistant Editor Frank McElroy keeps pace with his ball-point. Result of the New York City confab is a feature article about the compounds, a "Materials" highlight of the

Here's a quick preview
of features you'll find
in January's Chemical Processing



Confab on acrolein chemicals in NYC

January issue. Products are easy to handle, should find use in synthetic resins, plasticizers, pharmaceuticals, textile finishing, rubber chemicals, and the paper industry.

Polyester ducts vent fumes

Glass-reinforced polyester ductwork is very much in evidence at Lindsay Chemical Company's recent \$2½-million addition in West Chicago, Ill. Company, top producer of rare earths and thorium chemicals, uses the plastic "pipes" for collecting and venting SO₂, SO₃, H₂S, and other troublesome fumes from various reactions.

Assistant Editor Ted Meinhold visited the plant, came away with photos and details of the system.

Production stretches when dryer shrinks

Associate Editor Gordon Weyermuller, working with Edward Billstein, Plant Engineer of Congoleum-Nairn, comes up with a story about how and why that company switched from festoon to flat conveyor drying of their quality flooring material. New dryer is more compact (it's only 8 feet high while older dryer was 65 feet high), provides very close control of drying conditions. Most important: *Company foresees a five-fold production increase with only slightly increased manpower requirements.*



PERKIN

Announces

DC POWER

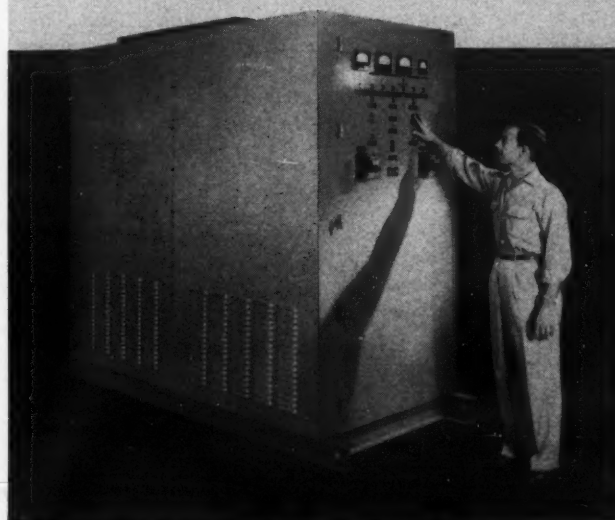
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DC and 100,000
Amperes and above



Typical 100 KW Germanium Rectifier Unit.

- Low Maintenance
- No Moving Parts
(Except for cooling fan)



power supplies

When inquiring check CP 2343 opposite last page

controls turbo-blower output

Naphthalene is catalytically oxidized to phthalic anhydride using air at above 450°F

By **WILLIAM C. CLARKE**, Assistant Editor
with **R. I. COOPER**, Plant Superintendent
Barrett Division
Allied Chemical & Dye Corporation
Chicago, Illinois

Two-and-one-half years ago Barrett Division, Allied Chemical & Dye Corporation, put a new phthalic anhydride plant on stream in Chicago's Calumet region. This plant was highly instrumentized and as modern as Barrett engineers could design. Principal emphasis of instrumentation was toward reducing manual operations.

Key to this process is control of air and naphthalene fed to a reactor where catalyst vanadium pentoxide breaks naphthalene's ring structure and oxidizes it to produce phthalic anhydride. Product is then fractionally distilled to high purity.

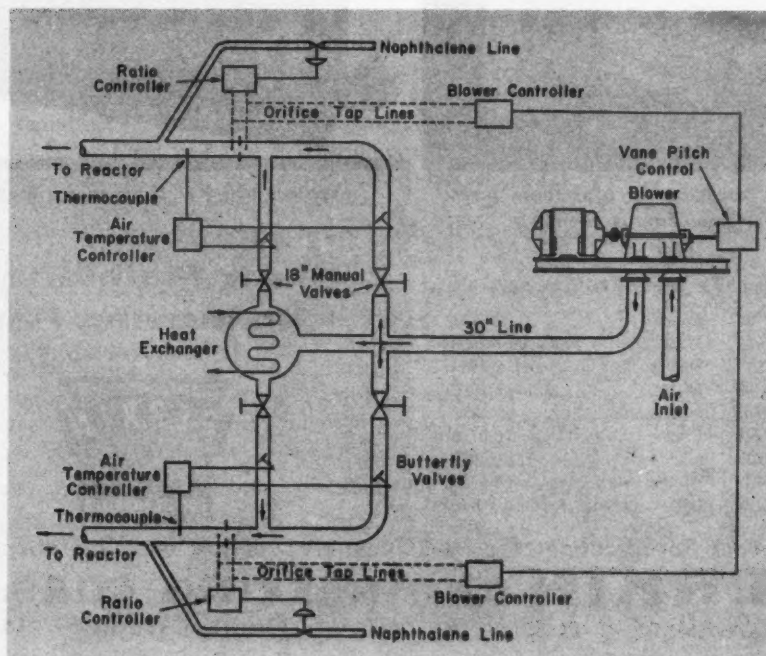
A large turbo-blower furnishes air for the system — at a volume, temperature and pressure required by the process.

Three major variables have to be held in control for satisfactory operation of the catalytic oxidation: total air rate, air temperature, and air/naphthalene ratio. One integrated system of controls accomplishes this.

To control total air rate, an orifice is placed in each leg of air line. Either one of these can be selected for automatic air rate control at any time. Operator sets up two conditions — total air to be delivered and air rate through one of the legs (called the "automatic" leg). Other ("manual") leg receives balance of blower's output. Thus it, too, is really under automatic control.

Orifice senses air rate in the automatic leg and drives a controller which positions pitch of blower's air vanes. This is accomplished by hydraulic

(Continued on page 26)



Air temperature, total air rate, ratio naphthalene to air are continuously controlled in Barrett's phthalic anhydride plant

Simplified schematic of control system







Combination alcohol-phenol recovery system pays off — Besides avoiding air pollution problem, company finds that it can . . .

***recover 2400 gallons
alcohol per day
plus a ton of phenol***

By **TED F. MEINHOLD**, Assistant Editor
with **W. F. STEWART**, Mechanical Engineer*
Panelyte Division, St. Regis Paper Company

Problem: Direct venting of solvent-laden air to the atmosphere was resulting in a considerable waste of alcohol at St. Regis Paper Company, Kalamazoo, Michigan. Solvents are used at the plant to cut phenol-formaldehyde resin used to laminate paper and other materials. Since the vented air also contained some phenol, there was the additional danger of air pollution, which the company was trying hard to avoid.

Solution: Engineers designed and installed an activated-carbon solvent-recovery system which includes a separate system for recovering the phenol. To prevent the highly contaminating resin from reaching the car-

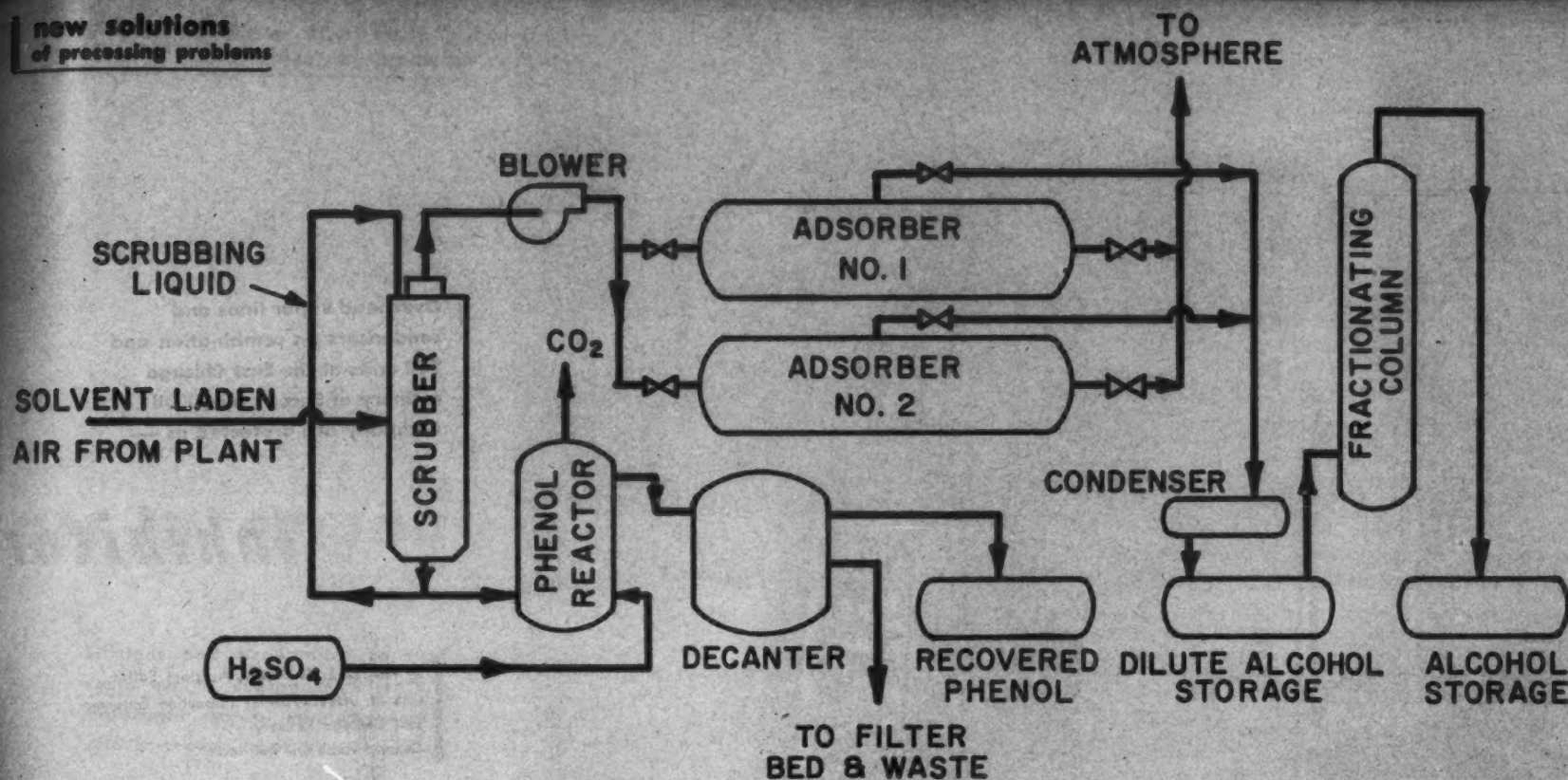
Solvent-laden air comes from main plant to recovery area through 36" diameter duct. Building at left houses fractionating tower, scrubber, and controls. Twin adsorbers are right

bon, a special scrubber was also installed. Solvent-laden air is drawn up through the scrubber, counter-current to the caustic scrubbing solution. Resin is continuously being absorbed by the recirculating solution. Part of the solution is constantly being drawn off and replenished with a fresh supply.

From the scrubber, the resin-free solvent-laden air enters two adsorbers. Each holds 30,000 lb of granular activated carbon and measures 10' in diam x 50' long. Solvent-free air passes directly to atmosphere after leaving adsorbers.

Adsorption cycle for each of the units lasts from 45 minutes to five hours, depending upon workload. When an adsorber reaches the end of a cycle, the air stream leading into it is automatically shut off, and steam is admitted. Steam drives alcohol off carbon, the released vapors passing through a condenser and into storage tank. Steaming takes 25 to 45 minutes. Adsorbers are steamed alternately so that one unit is in operation at all times. Fractionating column later sepa-

*Presently plant manager of St. Regis Paper Company's vacuum forming plant, Richmond, Indiana.



Flow chart of alcohol and phenol recovery system at St. Regis Paper Company, Kalamazoo, Michigan

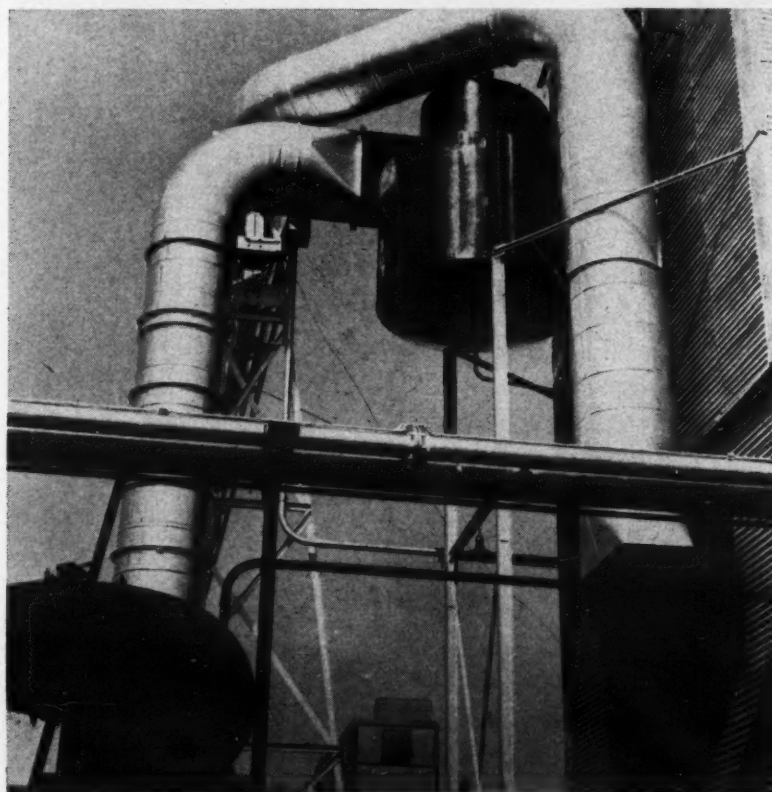
rates alcohol from the water solution.

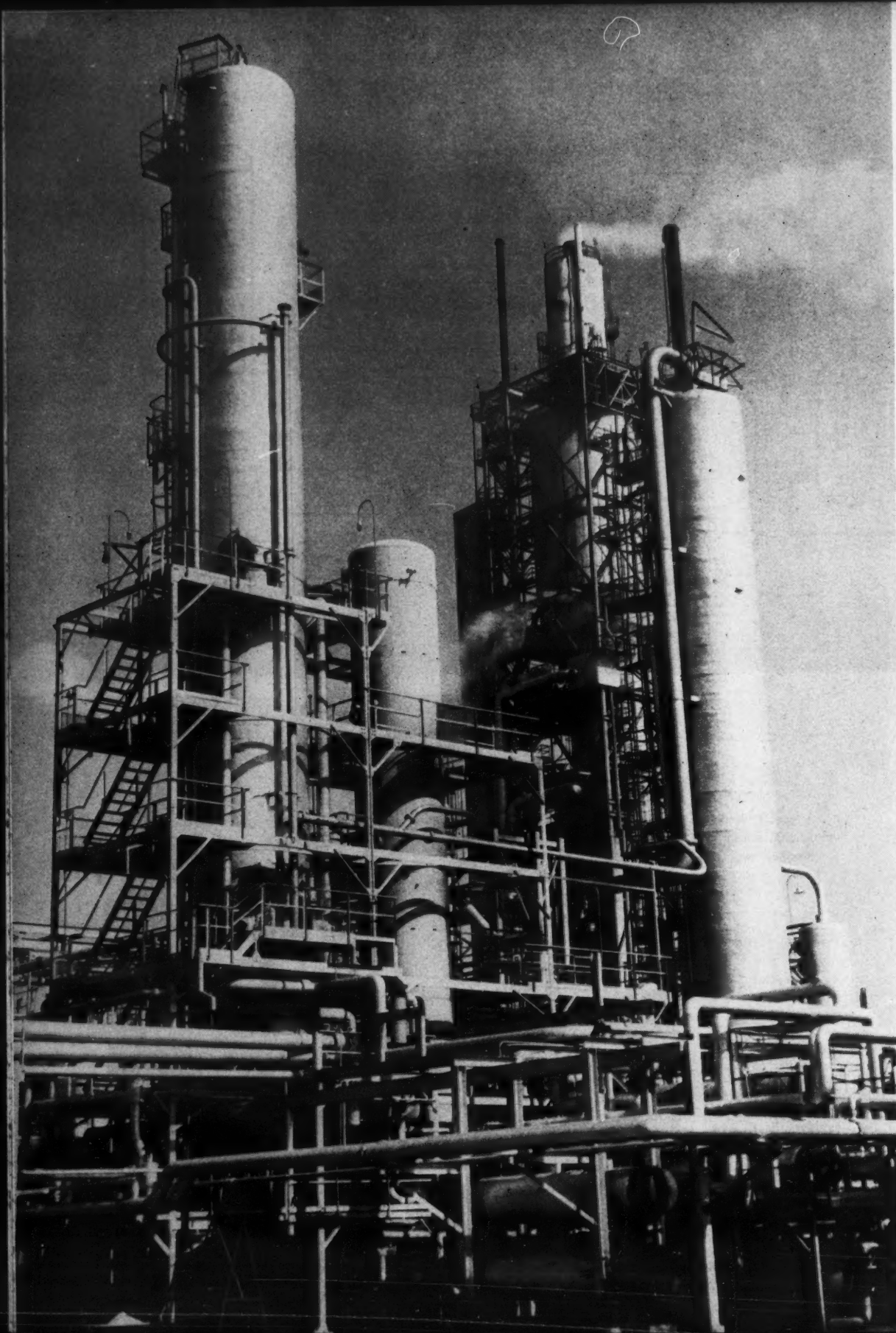
Solution drawn off from scrubber is reacted with 93 per cent sulfuric acid, which frees the phenol. Phenol is separated from the solution in a decanter. Recovered phenol is returned to plant for re-use. Neutralized waste from decanter is filtered and discarded.

Results: Plant recovers about 2400 gallons of alcohol in a 24-hour period. This is over 95 per cent of that volume present in the treated air. Phenol recovery is approximately one ton per day — which is practically 100 per cent. Volume of air treated by the system is about 20,000 cfm. The activated carbon is expected to last for years. Life span of adsorbers is indefinite. Similar systems have been installed at company's Trenton, N. J. and St. Jean, Quebec plants.

(Activated carbon for solvent recovery system was supplied by Activated Carbon Division, Pittsburgh Coke and Chemical Company, Dept. CP, Grant Building, Pittsburgh 19, Pa. . . or check CP 2344 opposite last page.)

Inlet and outlet of scrubber. Blower is at lower left. Due to northern location of plant, practically all outdoor lines are steam-traced





◀ Overhead vapor lines and condensers on combination and TCC units at the East Chicago refinery of Socony Mobil Oil Company are protected as —

inhibitor cut

By **FRANK E. McELROY**, Assistant Editor
with **M. JUSTER**, Senior Inspection Engineer
East Chicago Refinery
Socony Mobil Oil Co., Inc.

Problem: At Socony Mobil's East Chicago, Indiana, refinery, distillate coolers on TCC and Kellogg combination units were being corroded by acid vapors from magnesium and calcium chlorides present in the crudes. Temperature of the vapors entering the cooler is about 250°F. The coolers drop this about 80°.

Solution: Early in 1953, a corrosion inhibitor based on rosin amine was tried. This was added as a 5% aqueous solution to the overhead vapor line. Concentration in the unit was about 6 ppm, based on total overhead. A small amount of 5% aqueous ammonia is also added to this line in order to maintain a pH of 6½-7 in the water coming from the straight run reflux accumulators.

Known as Polyrad 1110A, the inhibitor contains 11 moles of ethylene oxide per mole of Rosin Amine D mixed with 10% of free Rosin Amine D. This rosin amine is a technical grade of dehydroabietylamine.

The way the inhibitor works is believed to be that a protective molecular film is formed on the metal surfaces, due to the semipolar nature of the compound. Nitrogen atoms of the Polyrad molecule are adsorbed on the metal surface, resulting in a uniform protective layer of closely packed inhibitor molecules. This film exists in an equilibrium

CP Staff Photo

cuts corrosion

**Efficient and economical to use,
rosin amine compound also has
detergent action, removes scale,
and improves heat transfer rates**

state. Its molecules are being adsorbed and desorbed at equivalent rates.

In addition to adding Polyrad, Socony Mobil also installed desalters for the crude entering the units. These not only served to reduce the amount of $MgCl_2$ and $CaCl_2$, but also alleviated salt deposits in the crude preheat system.

Results: Company feels that the inhibitor is doing an effective job. The filming action of the inhibitor serves not only to reduce corrosion, but also has a detergent effect that removes scale and other incrustations. These may clog pipes and tubes and also reduce heat transfer rates.

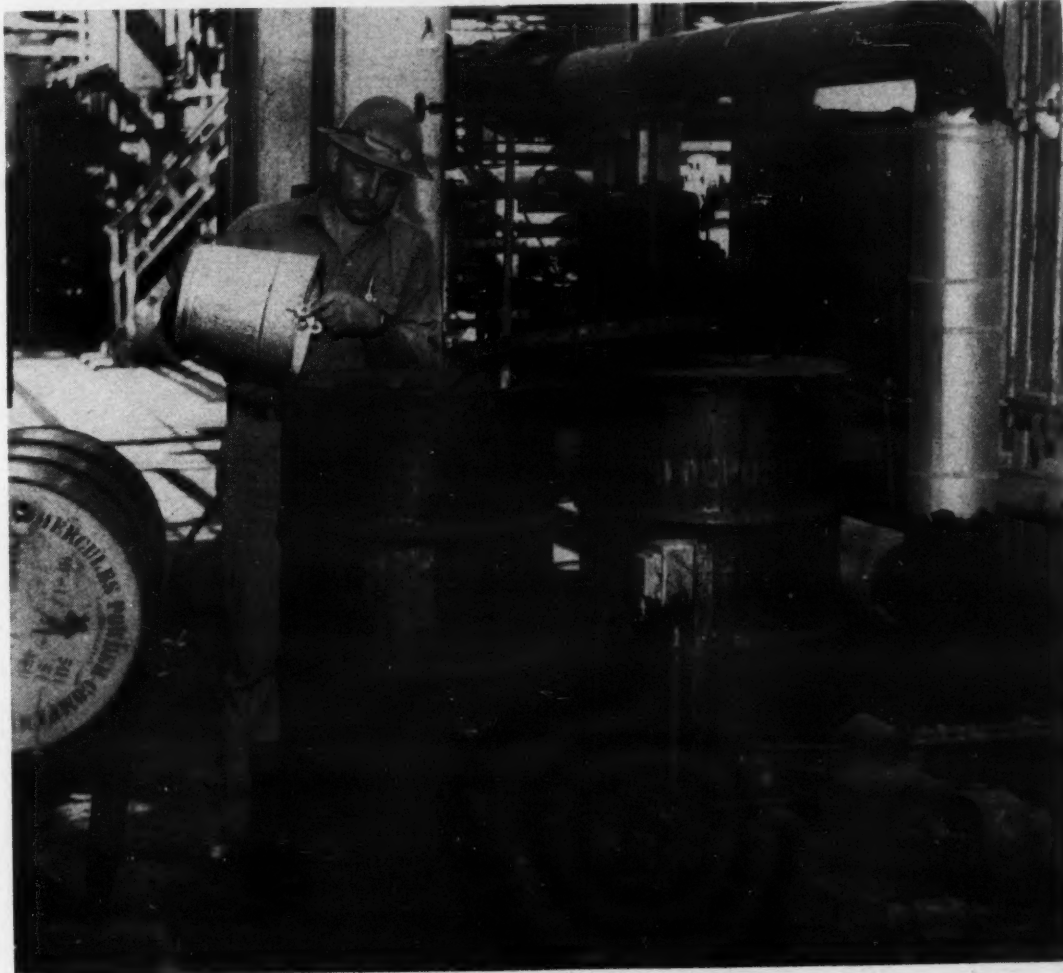
Socony Mobil is now using Polyrad in both their TCC and combination units as they have found it to work very satisfactorily and be economical to use. They found, too, that the still tower itself received a "residual protection" from the inhibitor, since some of it was returned to the tower in the reflux. The detergent action of the compound keeps the coolers clean, maintaining a high heat transfer rate.

Polyrad corrosion inhibitor is product of Hercules Powder Co., Dept. CP, Wilmington 99, Del. . . . or for more information check CP 2345 on form opposite last page.)

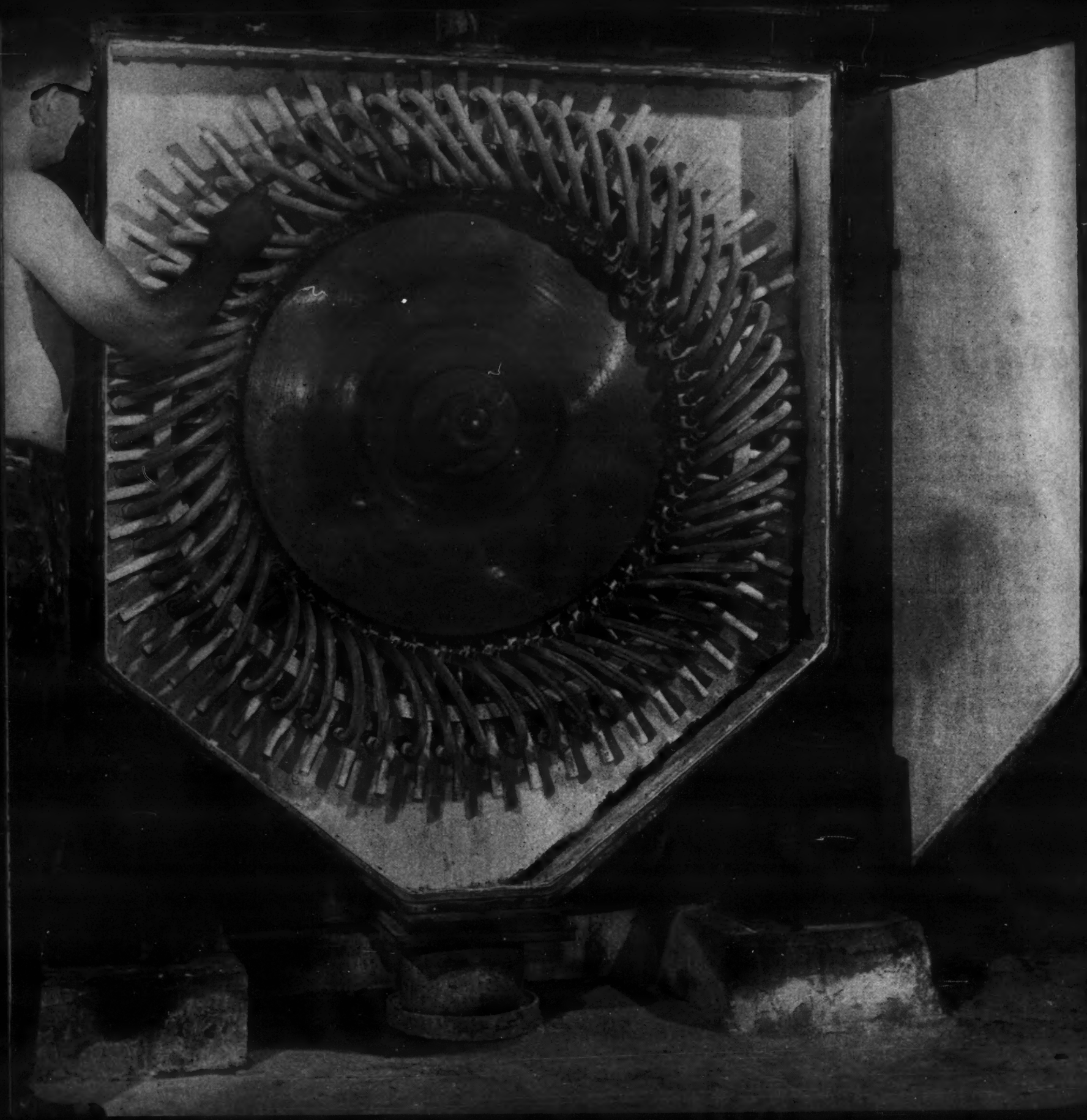


Two of the vapor condensers on the Kellogg combination unit that are protected by the inhibitor. Detergent action of the compound also removes scale, maintains good heat transfer rate

CP Staff Photos



Operator fills feed drum. From drum, Polyrad is fed by proportioning pumps to both units



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DECE

"Shock treatment" applied to paper coating slurry . . .

halves adhesive requirement

Physical characteristics of pigment changed after passing through high-speed dispersion mill

By **TED F. MEINHOLD**, Assistant Editor
with **JOHN FRANKOVICZ**, Technical Director
Champion-International Company

Problem: A method of reducing the amount of adhesive needed for preparing a calcium carbonate-type pigment paper coating was sought by engineers at Champion-International Company, Lawrence, Massachusetts. Since the price per pound of adhesive is considerably higher than that of the pigment, it is desirable to use the smallest feasible proportion of adhesive to pigment.

Solution: Studies revealed that by subjecting a slurry of the calcium carbonate-type pigment to "shock treatment" in a Rafton Mill (see *CHEMICAL PROCESSING*, May 1954, pages 142-143), the ad-

hesive requirement could be reduced considerably.

Mill consists essentially of a 36" diameter circular saw, $\frac{1}{4}$ " thick, mounted on a horizontal shaft rotated at 3600 rpm by a directly-connected 125 hp motor. Saw has 226 teeth, points of which are spaced at $\frac{1}{2}$ " intervals. The advancing surfaces of the teeth are radial. Jets of slurry at 80-100 psi are projected from the nozzles into path of advancing teeth. There are 60 nozzles arranged circumferentially around the periphery of saw. The severe shock imparted to the pigment by the saw teeth brings about the profound changes in the pigment that result in the lower adhesive requirement.

The pigment slurry (about 50% solids and containing about six pounds pigment per gallon of slurry) is pumped through the mill at room temperature and at the rate of approximately 100 gpm, which is equivalent to about 600 pounds pigment per minute. It takes about 20 passes through the mill to achieve the desired results. Slurry returns to supply tank by gravity after passing through mill.

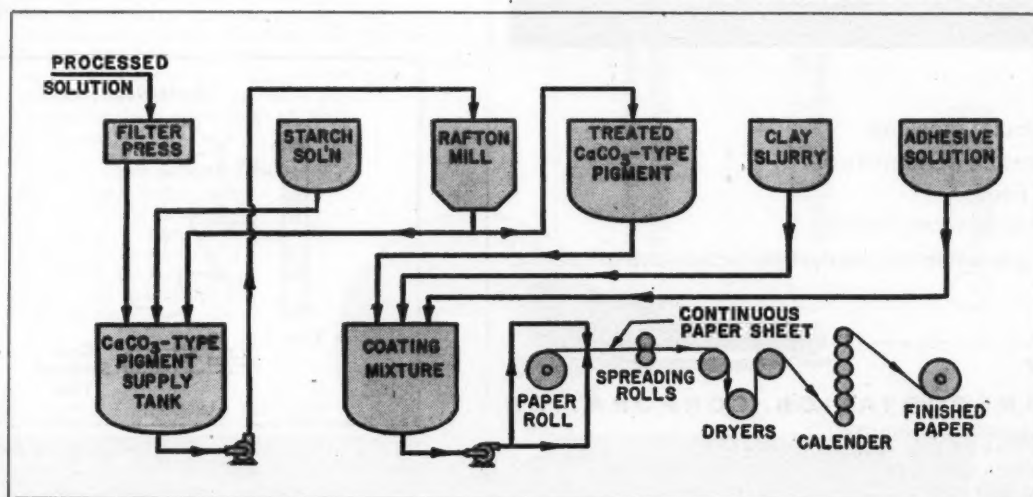
Pigment used by the company is produced as a

filter cake, containing 50-55% solids in water. Cake is reduced to fluid condition by mixing it with a 25% solution of modified starch cooked in water. About 1.5-2.5 parts of starch solids are used for every 100 parts of pigment solids. After shock treatment, proper amounts of clay and adhesive are added to slurry to produce the coating mixture.

Results: Treatment reduces adhesive requirement of the calcium carbonate-type pigment by about one-half. Treated pigment of uniform quality is delivered from mill at rate of 20 tons of pigment solids per day. Unit runs without attention except when starting up or shutting down.

(Continued on next page)

Operator adjusts one of the 60 nozzles arranged circumferentially around periphery of saw. In operation, jets of slurry are projected from the nozzles into path of advancing teeth



COATED PAPER

Coated paper is made by preparing a coating mixture, consisting of a concentrated water suspension of finely divided pigment and an adhesive, and applying it to a continuous sheet of paper on a coating machine. The machine spreads the mixture over the surface of the paper and dries the coated paper, which is then finished by running it through a vertical stack of rollers (called a calender).

Clay is the pigment widely used in coated paper, normally in conjunction with precipitated pigments of the calcium carbonate-type. The adhesive used may be modified starch or casein. Clay usually requires 15-27% of starch or 10-18% of casein to cause it to adhere properly to the surface of the paper. The calcium carbonate-type pigments require from 30-40% of starch or 20-27% of casein. The proportion of adhesive required by clay is within the limits generally considered economically satisfactory, but that required by precipitated pigments of the calcium carbonate-type is considered to be beyond those limits.

Article here deals with the application of a Rafton Mill as a means of reducing the proportion of adhesive required by the latter type of pigments at Champion-International Company.

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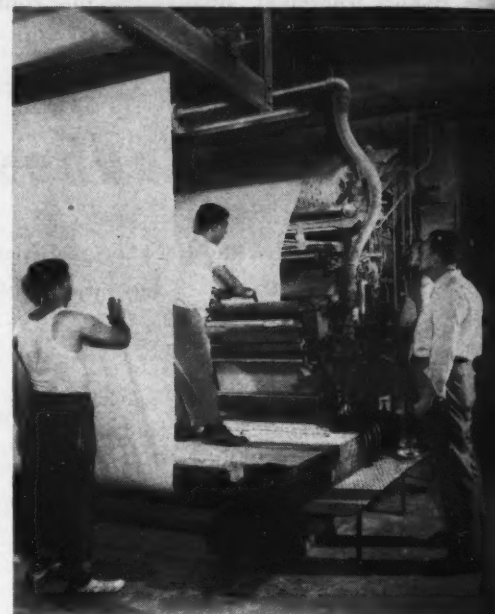


When inquiring check CP 2346 opposite last page

NEW SOLUTIONS of processing problems

HALVES ADHESIVE REQUIREMENTS

(Continued from preceding page)



"Wet end" of coating machine used to coat paper with precipitated pigment coating at Champion-International Company

A second mill has been added and is now in production.

Reason for reduction of adhesive requirement is not definitely known. However, Harold R. Rafton, inventor of mill, believes the following explanation may hold true:

The so-called ultimate particles of the calcium carbonate-type pigment, which may range from 0.2-0.3 micron upwards when viewed in an optical microscope, are believed not to be "ultimate", because the electron microscope has shown that

(Continued on page 19)

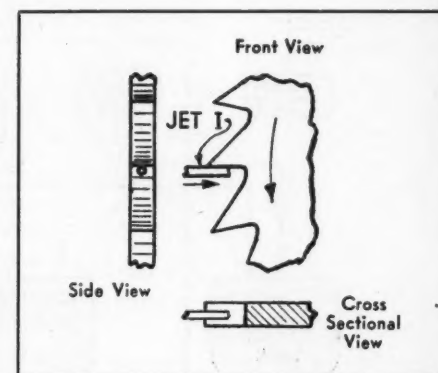


Diagram illustrates how saw tooth strikes jet of slurry coming from nozzle. Shock imparted to material brings about profound changes in slurry

Now ... GREATER FLEXIBILITY AND ECONOMY WITH *Speedline*



A NEW CONCEPT IN PROCESS PIPING



Each length of pipe shown at right costs one dollar! Why? *The thickness of the pipe wall!* Yet with Schedule 40 pipe and screwed fittings you lose $\frac{1}{2}$ the wall you bought—at the threads. Lighter wall pipe meets pressure safety requirements for process piping (one inch size at 150 psi, Schedule 10—83 to 1 safety factor; Schedule 5—50 to 1 safety factor) . . . correct analysis effectively combats corrosion and contamination regardless of wall thickness!

Now . . . you can save up to 50% in materials costs . . . get 10 to 12% greater flow capacity . . . and SPEEDLINE Fittings are especially designed for low cost, light-wall Schedules 5 and 10 pipe.

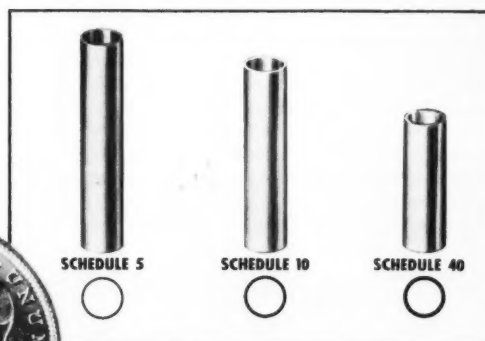


BUY ONLY THE PIPE WALL YOU NEED

EXCLUSIVE FEATURES OF SPEEDLINE FITTINGS

offer economy and assembly advantages never before possible with conventional fittings—

- Multiple choice of joint with *every* fitting!
- Simplified design and assembly on the most complicated installations!
- Use of low cost Schedules 5 and 10 stainless steel pipe!



... CUT COSTS WITH SPEEDLINE FITTINGS



LEADING PLANTS SET NEW STANDARDS IN PIPELINE ECONOMY

Speedline

AN INDIANA FERTILIZER PLANT REPORTS:

Only 3.2% of Total Piping Costs go for Labor! Cost breakdown on a recently completed stainless steel piping installation at E. Rauh and Sons Fertilizer Company, Indianapolis, Indiana, revealed 96.8% of the total expenditure was for materials . . . only 3.2% for labor!

Materials costs represented exceptional savings, too, because Plant Engineer was able to use low cost Schedule 5 pipe with SPEEDLINE Fittings for the entire line . . . without loss of effective wall for pressure and flow requirements. The result? Almost 50% saving in material costs as compared to using Schedule 40 pipe with conventional fittings!

A PENNSYLVANIA PROCESS PLANT REPORTS:

"Schedule 5 stainless steel pipe and SPEEDLINE Fittings were selected because of economy and because they were easier to install. Also SPEEDLINE Fittings assured a leak-proof joint."

A NEW JERSEY PLANT REPORTS:

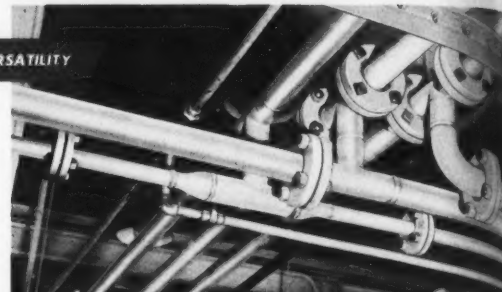
"The use of SPEEDLINE Fittings practically eliminated turbulence in our lines, and the use of Schedule 5 pipe increased the flow over 10%."

AN EASTERN CHEMICAL PLANT REPORTS:

"SPEEDLINE Fittings were selected because they effected a 50% cost saving in materials and assembly."

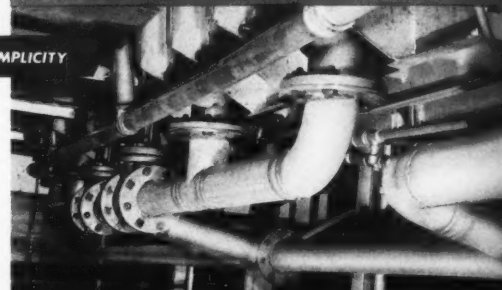
FITTINGS MAKE THE DIFFERENCE!

VERSATILITY



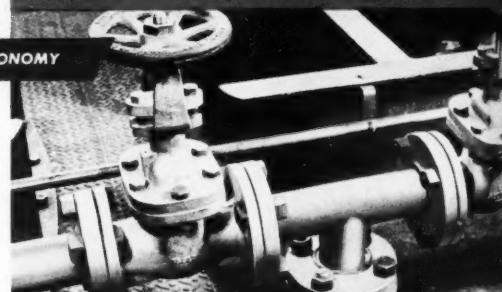
Speedline insert flanges, tees, elbows and reducers with Schedule 5 pipe.

SIMPLICITY



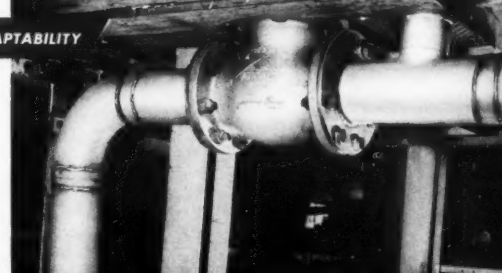
Aligning connectors simplify field erection.

ECONOMY



Speedline insert flanges, connect pipe and fittings to the valves in this process line.

ADAPTABILITY



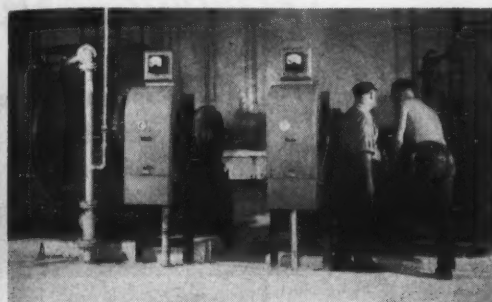
Tees, reducers, 90° and 45° elbows, aligning connectors on process line.

Speedline

STAINLESS STEEL FITTINGS are manufactured and distributed by Horace T. Potts Company, 564 E. Erie Avenue, Philadelphia, PA. SPEEDLINE Distributors are located in principal cities from coast to coast.

HALVES ADHESIVE REQUIREMENTS

(Continued from page 18)



Side view of the two Rafton Mills used in the paper plant. Pipe at left feeds slurry into new model mill. Older model on right has similar set-up

similar precipitated particles really constitute individual clusters, each made up of more minute crystals. These clusters are porous in the sense that the minute crystals do not fit together closely at all points within the clusters.

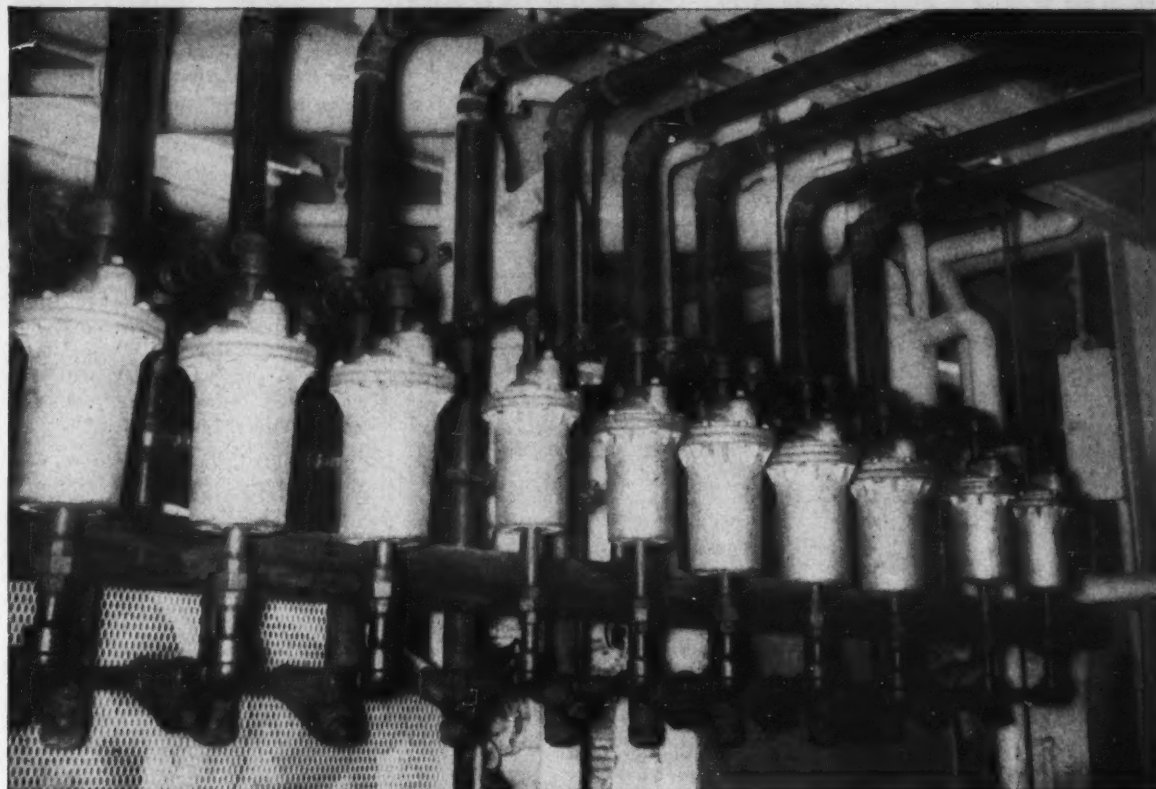
When an adhesive solution is mixed with these clusters, it is thought that a portion of the solution coats the surface of the clusters and that another portion works into the pores. Only that portion of the adhesive on the surface of the clusters is useful for making the pigment adhere to the surface of the paper; that working into the pores is not.

Rafton thinks that the shock action of the mill acts to compress or densify the individual clusters so that the pores between the minute crystals making up the clusters are reduced in size, if not substantially eliminated. Thus, when the adhesive solution is mixed with these condensed clusters, it coats their outside surfaces as before, but the portion of solution which penetrates into the clusters is much less than before, if not practically negligible. Thus most, if not all, of the adhesive solution does useful work on the surface of the clusters, rather than being partly ineffective in the pores of the clusters. This would reduce the amount of adhesive needed to make the clusters adhere to the paper; thereby reducing the overall adhesive requirement for the pigment coating.

Mills have been used for modifying properties of other materials (both inorganic and organic). Processes worked out with a laboratory model can be duplicated on commercial size unit in any tonnage quantities.

(Mill is product of Rafton Engineering Corporation, Dept. CP, P. O. Box 8, Shawshen Village Station, Andover, Mass. . . . check CP 2347 opp. last page.)

For more information on product at left, specify CP 2348 . . . see information request blank opposite last page.

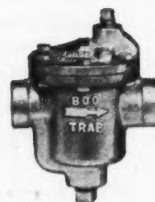


Tip on Choosing Steam Traps: Run Tests with a Pyrometer



Bottom inlet-top outlet traps in six sizes, 1/2" to 2" connections; 950 to 20,000 lbs./hr capacity.

Side inlet-side outlet traps in five sizes, 1/2" to 1 1/4" connections; 680 to 6700 lbs./hr capacity.



Integral strainer traps in three sizes, 1/2" and 3/4". Cost less than trap and separate strainer, save fittings and labor.

A common problem—Traps on Rogers spray driers at Rochester Dairy Company, Rochester, Minn., required frequent servicing—used up about two months of one man's time annually. And, then, within about 30 days after trap servicing, drier temperatures would be 100 degrees below steam temperature. Nobody has to put up with such trap troubles!

Take a tip from this solution!—Henry T. Maass, Building and Utility Supt., took action. He ran extensive pyrometer tests on his driers, using different makes of traps.

100° hotter!—The driers are now equipped with Armstrong inverted bucket steam traps. Temperatures correspond to steam pressure—100 degrees hotter than before. Maintenance?—negligible. Rochester carries \$63.31 of Armstrong trap parts in maintenance store against

\$873.52 in parts for another make of traps that haven't been replaced yet.

Moral—A small investment in Armstrong steam traps can make a world of difference in performance of production equipment and in cost of maintenance. Call your local Armstrong Representative, he has the products and the experience and the ability to be of real assistance.

FREE CATALOG

The 44-page Steam Trap Book is "the handbook of steam-trapping". Selection, installation, maintenance, capacities, data, prices, tables, charts, useful material—yours for the asking without any obligation. Also see data in Sweets or Chemical Engineering Catalog.



Armstrong Machine Works
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Application Engineered
ARMSTRONG STEAM TRAPS

When inquiring check CP 2349 opposite last page

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DENVER	SIZES	SIZES	
(patented) SUPER AGITATORS and MIXERS		3'x 3' to 20'x 20'	Patented standpipe around propeller shaft assures positive agitation and circulation. Patented wearing plate prevents sand-up on shut-down. Heavy duty as well as acid proof construction is available in both open type, air lift and Super Agitator model. Please write for Bulletin No. A2-B4.
DENVER Steel-Head BALL MILL		3'x 2' to 6'x 12'	A Denver Steel-Head Ball Mill will suit your particular need. Five types of discharge trunnions. All-steel construction. Low initial cost due to quantity production. Quick delivery. Laboratory and pilot plant mills also available. Please write for Bulletin No. B2-B13.
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DENVER Disc FILTER		1 Disc, 2' to 8 Disc, 6'	Special, patented design of segments in Denver Disc Filters use both gravity and vacuum to give a drier filter cake. Drainage is complete and positive, with no blow-back. Simple, low-cost, dependable construction. Quick delivery. Also Drum and Pan Filters. Please write for Bulletin No. F9-B2.
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DENVER Standard DRYERS		2'x 15' to 5'x 40' and larger	Available in several types: Direct Heat, Indirect Heat, and Steam Tube. Let DECO Engineers solve your drying problem. No dry problem too small or too large. Please write for Bulletin No. D4-B2.

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NEW SOLUTIONS of processing problems

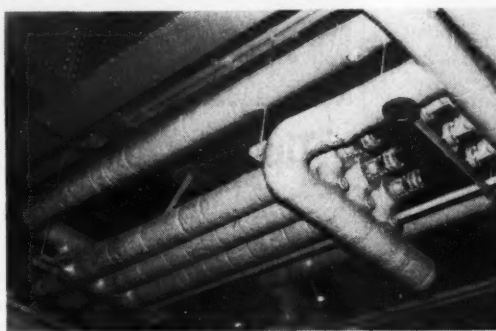
Hot HCl solution of thorium cooled quickly in low-cost glass heat exchanger . . .

unit shipped in handy kit, can be easily assembled

Problem: A low-cost and efficient way of cooling a hot corrosive hydrochloric acid solution of thorium was sought by engineers at Lindsay Chemical Company, West Chicago, Illinois. Temperature of the hot solution was 175°F and it was desired to cool it to about 60°F. Operation is part of overall process for producing rare earth and thorium chemicals from monazite ore. Company is largest US producer in this field.

Solution: Engineers chose a Pyrex-brand glass heat exchanger for the job. Shipped from supplier as a complete kit, unit can be easily assembled at any plant.

Exchanger consists simply of three parallel-mounted sections of 2" Pyrex-brand glass heat exchanger pipe individually jacketed with conventional 3" black iron pipe. Each section is 10' long.



Low-cost glass heat exchanger is well-suited for handling corrosives

Flanged adapters are used to attach sections to plant's process piping (saran-lined in this case). When assembled, sections may be covered with conventional insulation. Water is used for cooling.

Results: Unit performs cooling job quickly and efficiently. Normal flow rate through exchanger is about 15 gpm. Maintenance is negligible.

(Pyrex-brand glass heat exchanger pipe is product of Plant Equipment Sales Dept., Corning Glass Works, Dept. CP, Corning, New York . . . or check CP 2351 opposite last page.)

This month's Processing and Engineering
Data section starts on page 204



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P3-88P1

When inquiring check CP 2352
opposite last page

CHEMICAL PROCESSING

When inquiring check CP 2350 opposite last page

NEW SOLUTIONS

Evaporator tube life expected to double at distillery . . .

Hiram Walker installs stainless tubes in stillage unit

Double life and increased operating efficiency are expected to result from use of stainless steel tubes in stillage evaporator at Hiram Walker & Sons, Inc., Peoria, Illinois. Tubes are made of 16-gage 304 stainless. Unit has a total of 908 tubes, each 84" long and 2" OD.

Both inside and outside of tubes are subject to corrosive attack. Exterior is exposed to 212°F vapors containing varying amounts



There are 908 tubes in the evaporator, each 84" long and 2" OD

of organic acids. Interior is subjected to the material being evaporated — spent stillage, containing 3% solids, that is concentrated to 30%.

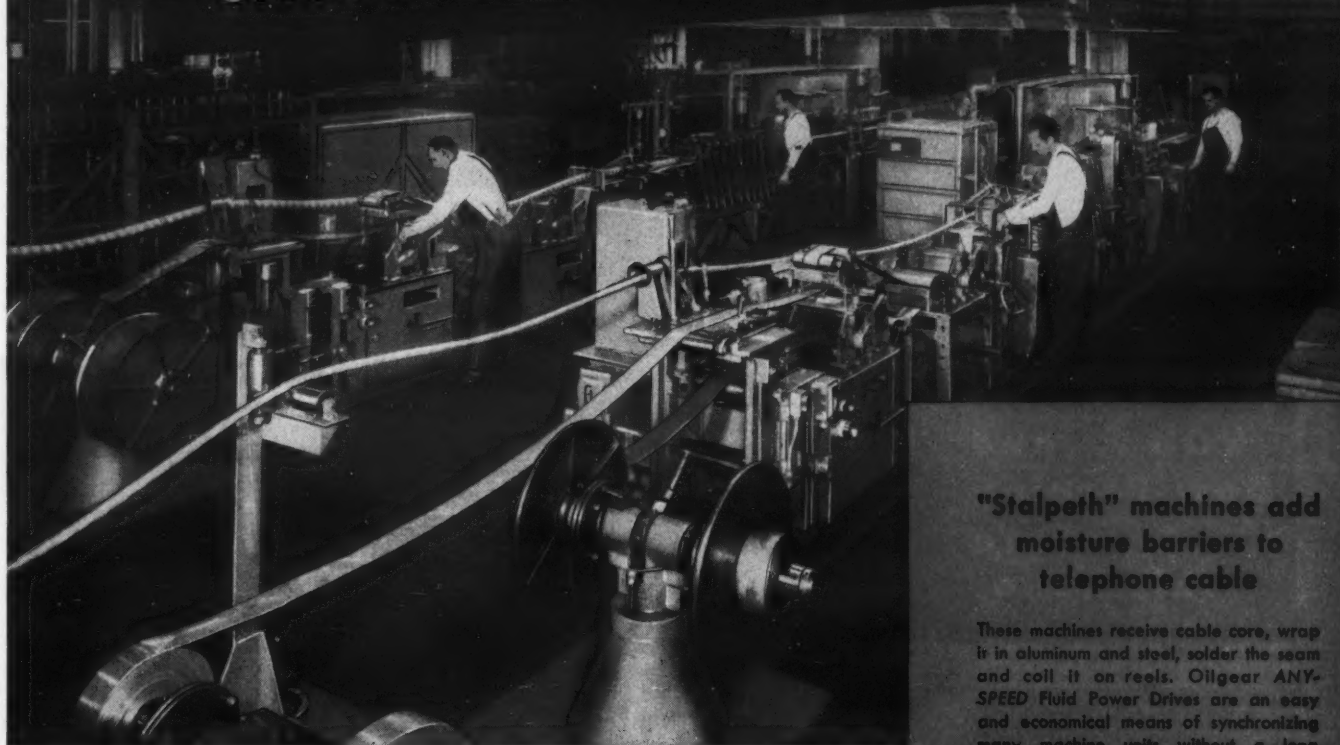
Once a week insides of tubes are cleaned with 4% caustic, and then neutralized with acid. This keeps heat transfer to a maximum. Tube's thinner walls — 0.065" compared with 0.120" of previous metal used — give the new tube 14½% greater capacity.

(Type 304 stainless tube was supplied by the Alloy Tube Division, The Carpenter Steel Company, Dept. CP, Union, N.J. . . or check CP 2353 opposite last page.)

For more information on product at right, specify CP 2354 . . . see information request blank opposite last page.



OILGEAR FLUID POWER DRIVES



"Stalpeth" machines add moisture barriers to telephone cable

These machines receive cable core, wrap it in aluminum and steel, solder the seam and coil it on reels. Oilgear ANY-SPEED Fluid Power Drives are an easy and economical means of synchronizing many machine units without a long lineshaft.

Solving the problem of close synchronization of driven members

As machines become more and more complex, combining more and more functions into a single unit, the problem of driving these machines successfully becomes more difficult.

This problem confronted Western Electric Company engineers in designing what they call their "Stalpeth" machines, two of which are shown above. These machines combine corrugating of steel and aluminum strips, forming them around the cable core, soldering the seam and then winding the assembly on reels at the far end. All of the members of the machine must be synchronized to the speed of the capstan unit. Going by their experience with other somewhat similar machines, Western Electric engineers again turned to Oilgear "Any-Speed"

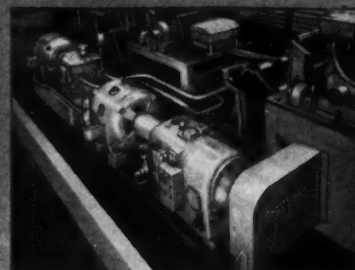
Fluid Power Drives, to solve what is really a complex problem ordinarily. Oilgear units provided an easy and economical means of synchronizing many machine components.

Oilgear Any-Speed Fluid Power Drives and transmissions do offer many machine design advantages including ease of control and synchronization of driven members, steplessly variable speed, fundamentally simple circuits, and long, trouble-free life. Write for Oilgear drive bulletins. THE OILGEAR COMPANY, 1583 W. Pierce St., Milwaukee 4, Wisconsin.

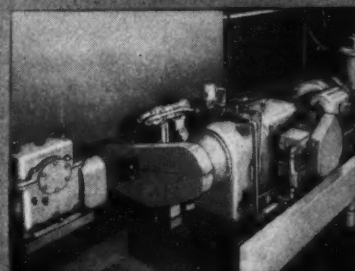


PIONEERS . . . NOW THREE PLANTS FOR FLUID POWER

PUMPS, MOTORS, TRANSMISSIONS, CYLINDERS AND VALVES



These Oilgear ANY-SPEED units drive the aluminum and steel corrugator units in perfect unison with the governing capstan unit.



The Oilgear ANY-SPEED capstan drive. Not shown here is another Oilgear unit driving the cable winding reels.



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because you are always looking for ways to make new and better products. By inventing new and better machines that operate at temperatures beyond the limits of conventional materials, you created a rapidly growing need for our silicone fluids, greases, compounds, resins and rubber with their extraordinary indifference to time, temperature and weather.

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and because everyone wants more comfort and protection. We invested years of research and development work to create silicone finishes for fabric and Sylflex[†] for use in tanning leather. These silicone products make your clothing, shoes and upholstered furniture shed water and water borne stains, feel better and stay new looking longer with less care.

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* Presented every second year since 1933 by Chemical Engineering magazine to the company or the industry that has, in the opinion of the nation's leading educators in the field of chemical engineering, contributed the most to the advancement of chemical engineering in industry.

for a copy of "What's a Silicone?" and a Reference Guide to Dow Corning Silicone Products, please address Dept. 3212-B.



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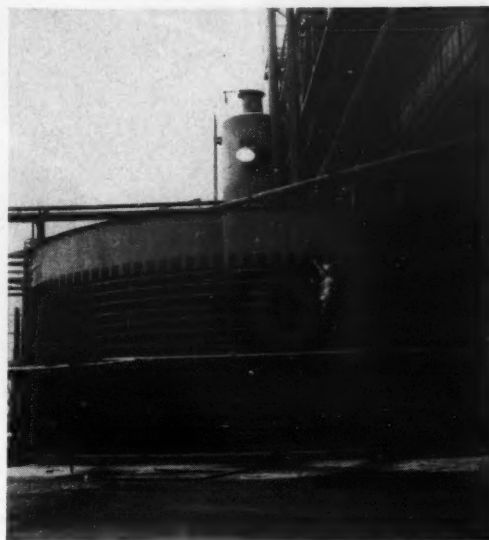
When inquiring check CP 2355 opposite last page

NEW SOLUTIONS of processing problems

Kaiser cuts maintenance costs through use of cellular glass for insulating tanks . . .

sealed blocks held in place by Monel bands resist humidity and corrosion

Problem: At Kaiser Aluminum & Chemical Corporation, Baton Rouge, La., type of insulation used on the outside of storage tanks resulted in excessive maintenance. Blankets of the insulating material were unsatisfactory mainly because of increased weight due to absorption of moisture. High humidity, rapid changes in humidity, heavy



CP Staff Photo
Cellular glass insulation being installed on a tank at Kaiser Aluminum & Chemical Corp. Note Monel bands holding blocks

rains, and high winds made conditions worse. Water would get behind sealing coat, making it difficult to maintain seal. Chicken wire cover corroded in a relatively short time. In some cases, the insulation on a tank would rip off and fall in a sodden heap.

Solution: About three years ago, company started using cellular glass insulation which is impervious to moisture and chemical fumes. Blocks of the material 6 x 18 x 1½" are sealed on tank by the use of Anderson-Pritchard Microseal compound. Insulation is further secured by fastening ½" Monel bands around tank.

Results: Present method of insulation has prevented the harmful effects of humidity and corrosion, as well as serving as an efficient heat barrier. Life of insulation has been greatly extended and maintenance cut down. The sealed cellular blocks held in place by Monel bands are used for insulating hot water tanks and process vessels containing hot sodium aluminate process liquors.

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bugs beware

Problem—grinding waxy DDT solids into useable powder. The generated heat tended to turn them into liquid. Pulverized dry ice mixed with the large pieces of DDT froze them hard and brittle—the rest was easy!

miracle fibre needs miracle gas

Expanded into a chamber, liquid CO₂ produced the low temperatures needed to separate paraxylene (an ingredient of DACRON[®]) from petroleum. Result—no more baggy knees!

*Du Pont's trade-mark for its polyester fibre

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When inquiring check CP 2356
opposite last page

CHEMICAL PROCESSING

NEW SOLUTIONS of processing problems

Several hundred vessels, varying in capacity from 2000 to 400,000 gal are insulated in this manner at the plant.

(Foamglas cellular glass insulation is a product of Pittsburgh Corning Corp., Dept. CP, One Gateway Center, Pittsburgh 22, Pa. . . or for more information check CP 2357 opp. last page.)

**Damage to product eliminated,
less operator attention needed
with weigh-fill unit . . .**

fills bags or fiber drums accurately without constant weight check

Problem: Auger packer formerly used at Armour & Company, Chicago, to fill soap chips or powder was damaging some products (chips) and creating a dust nuisance. Furthermore, each bag or drum had to be weighed on a platform scale as it was filled. This method called for constant operator attention.

Solution: In 1954, Armour installed two double-spout pre-weighing bag and drum fillers to handle this commercial soap chip and powder production. The filling unit itself is located on the second floor, while the pre-weigh scales are located on the floor above. Scales in turn are supplied from dryers



CP Staff Photo
Pre-weighed soap chips being bagged at Armour & Company. Vibrator (arrow) assures compact fill. Respirator worn by operator is safety precaution

which are located on the fourth floor of the building. Soap chips are fed to the scales by gravity, while powdered soap is fed by screw conveyor. Conveyor can't be used with chips since, as in former filling operation, chips tend to break down when conveyed by auger.

(Continued on next page)



This Allis-Chalmers Bearing Design Gives More for Your Motor Dollar

You can lubricate these bearings without dismantling the motor. Pipe-tapped holes in the bearing housings at two points provide means for inserting new grease, flushing out old grease and relieving pressure during re-greasing.

The bearing cap is held tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, minimizes the possibility of grease entering the interior of the motor . . . retains an ample supply within the bearing enclosure.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt barriers.

Look for the extra bolts on the end housing . . . the sign of greater value. Ask your Allis-Chalmers representative or Authorized Distributor to give you the facts on this maintenance-saving design. Or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin, for Bulletin 51B7286.

A-4855

ALLIS-CHALMERS



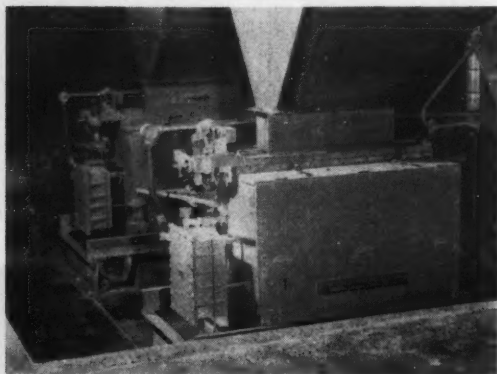
When inquiring check CP 2358 opposite last page

(Continued from preceding page)

In filling operation, operator merely pulls chain to release pre-weighed soap into fill hopper. Touch of a button starts fill and also actuates (in chip filling) a B. F. Gump vibrator under bag (see arrow in photo on p. 23). This unit is tied into bag filler with a timer relay and is set to vibrate during fill for a predetermined time. After shake-down of product, vibrator automatically shuts off.

While bag or drum is being filled, another accurately weighed load has automatically been made ready by the scale on the floor above.

Results: Since the installation of this weigh-fill unit, Armour has ceased to have soap chips packed in a damaged condition. Predetermined weights, ranging from 75 to 235 lb, are correct as filled.



CP Staff Photo
Pre-weighing scales are located on floor above filler. Accurate batches are supplied automatically each time filler is actuated

Operator need pay much less attention to filling operation. Dust nuisance, especially with chips, has been considerably reduced, although a respirator is still worn by operator as a safety precaution.

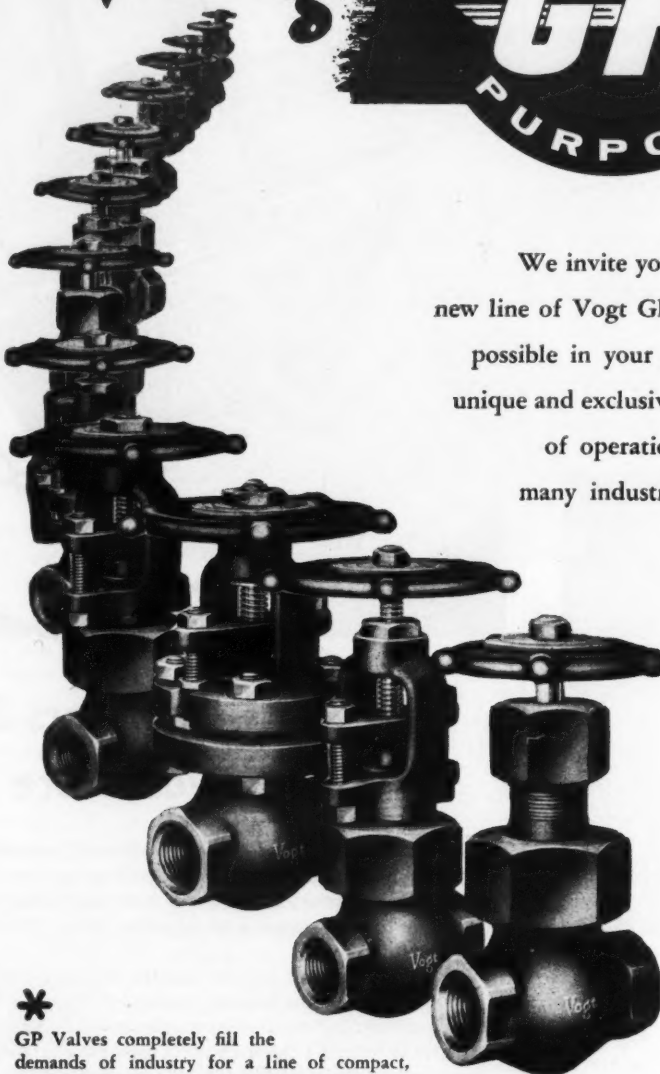
(Model G-38 bagging scale is a product of Richardson Scale Company, Dept. CP, Van Houten Ave., Clifton, N.J. Check CP 2359 opp. last page.)

Gives solution to 13 difficult dock loading problems

Solutions to 13 different dock loading and yard loading problems are outlined in four-page folder. In each case, a line drawing is used to illustrate the problem. Photos show how problem was solved. Problems include loading rail cars, car-to-car loading, and loading trailers where ramp facilities are limited or non-existent.

"How to Solve Specific Loading Problems" is issued by Magnesium Company of America, Materials Handling Division, Dept. CP, East Chicago 19, Indiana. Specify CP 2360 opp. last page.

For wider adaptation . . . and unmatched Service Life . . .



We invite you to inquire into the savings which the new line of Vogt GP Drop Forged Steel Valves can make possible in your operations. Not only do their many unique and exclusive features make them more economical of operation, but their broad adaptability to so many industrial applications permits a substantial reduction in operating overhead.

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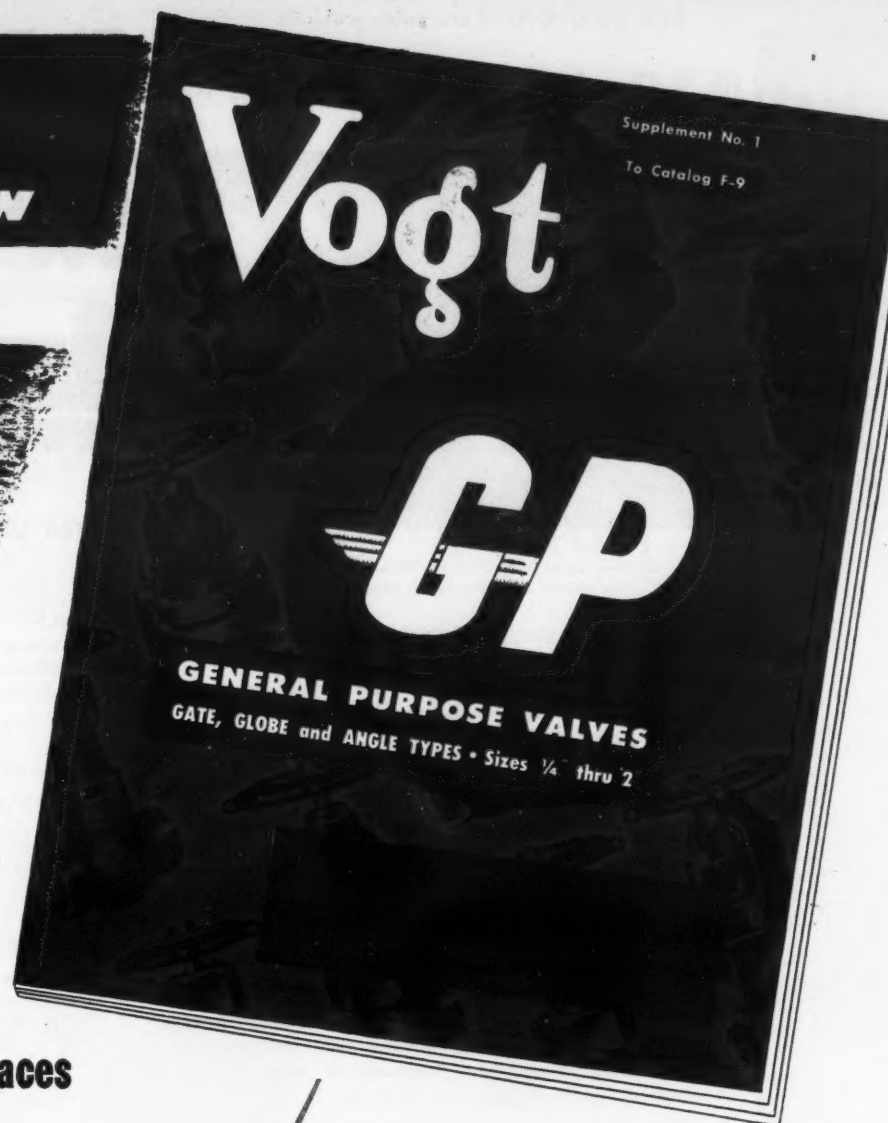
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This 32-page catalog illustrates and gives complete specifications on 11 types of the new Vogt GP forged steel gate, globe and angle valves. Send for your free copy — for ready reference in purchasing. Use the coupon for convenience.



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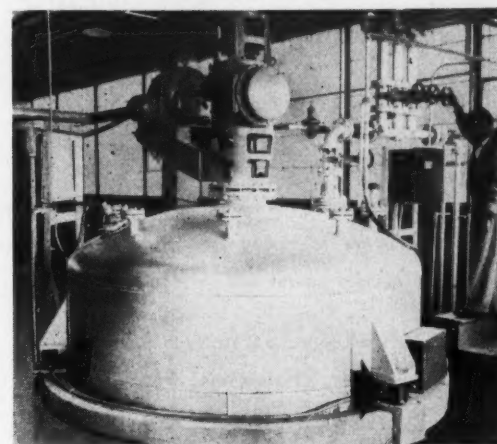
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NEW SOLUTIONS of processing problems

**Rubber compounding 50% faster
with electric load cell
weighing system**

Problem: Compounding of natural rubber latex with synthetic latices was a tedious and time consuming operation at Naugatuck Chemical Company, division of US Rubber Company, Los Angeles, California. Limitations arose from the fact that only one latex could be measured volumetrically and two or more others had to be taken from bulk storage, weighed in small batches, and dumped into the tank manually. In quantity production this inefficiency became quite costly.

Solution: Company supported a 4000-gallon tank on three Baldwin SR-4 load cells. These sense weight changes electrically and transmit signals that are totalled automatically on the scale of a direct-reading null-balance indicator. Latices are



Arrows show two of the three load cells installed on 4000-gallon weighing tank. Cells transmit weight signals to indicator in front of operator

pumped directly from bulk storage into tank through control valves over the indicator. This permits operator to control flow of each latex as he watches the indicator. Flexible link in piping eliminates effects on weight measurements.

The combination of three load cells of 20,000-lb capacity each provides for weighing the empty tank and approximately 50,000 lb of contents. Indicator is set to read directly in net weight of contents. Device is calibrated in 20-lb divisions; can be read within 10 lb of actual weight.

Results: By weighing the compounding tank continuously as each latex is added, a 50% speed-up in the operation has been achieved. In addition to increased efficiency and lower costs, accuracy of compounding has also improved.

(SR-4 load cells and direct-reading indicator are product of Baldwin-Lima-Hamilton Corporation, Dept. CP, 940 Simpson Street, Philadelphia 42, Pa. . . . or check CP 2362 opposite last page.)

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NEW SOLUTIONS of processing problems

CONTROLS TURBO-BLOWER OUTPUT.

(Continued from page 10)



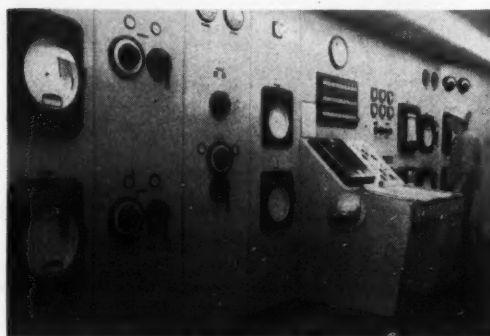
CP staff photo

Control signal is applied to this unit to position inlet main stream butterfly for air-temperature control

amplification in controller. The difference between the adjusted or set desired rate of total air flow and the actual one measured by the orifice displaces a hydraulic jet relay. This repositions the inlet vanes of the blower until difference is zero. Air flow rate in the manual leg is controlled by means of the butterfly.

Air temperature, second of these important variables, is picked up by thermocouples downstream from the orifice. Signal developed by each thermocouple is applied to control unit. It adjusts temperature by throttling a by-pass around heat exchanger. Normally, butterfly valves in lines leaving this heat exchanger operate nearly fully open. Bypass valves are nearly closed. In operation, low temperature will result in opening main stream air valve (if it is not already full open) and throttling by-pass. An independent temperature control system is used for each leg.

To hold process under control, third variable, ratio, naphthalene to air, is also controlled. This is done by controlling naphthalene addition to air stream. Taps leading to the air rate orifice in each leg go to naphthalene controller as well as to blower controller. Control valve setup maintains



CP staff photo

Integrated control system is run from this panelboard

EL DORADO COCONUT OIL



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*T.M. Reg.

For samples and specifications, write
Dept. P.



P. O. Box 599, Oakland 4, Calif.

When inquiring check CP 2363
opposite last page

CHEMICAL PROCESSING

naphthalene flow in direct proportion to air rate for each leg.

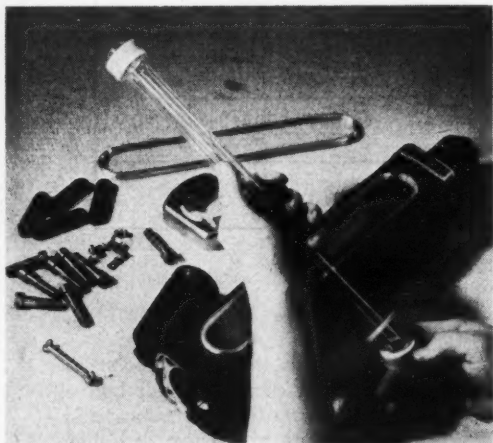
While manual valves in all air lines parallel automatic valves, they have never been put to routine use in this plant. Their only service has been in isolating one leg for maintenance.

(Control elements for this system were furnished by Askania Regulator Co., Dept. CP, 240 E. Ontario St., Chicago 11, Ill. Check CP 2364 opp. last page.)

**Packing stops rotameter leaks —
withstands hot mineral oil,
styrene monomer . . .**

used on all services except cold water, gas

Problem: Numerous liquid flow meter "leakers" were a plague to maintenance men servicing new production section of large midwest chemical company running styrene monomer and hot mineral oil. Deterioration of packing glands sealing meter's calibrated glass tube caused failure after a few days or hours service on the line. Organic rubber, cork, asbestos, synthetic rubber, and fluorocarbon plastics shredded or impregnated into asbestos were tried unsuccessfully.



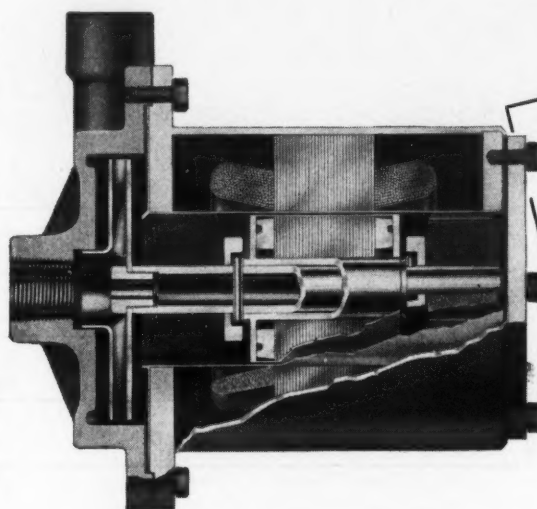
Packing glands are easy to assemble and tighten down

Solution: Packing glands were fabricated from Silastic, a rubber-silicone formulation. Compound was easy to stop, assemble, and tighten down.

Results: Leakers promptly stopped. Backlog of flow meters needing repairs was eliminated. Slight swelling of packing in contact with media simply made seal tighter without breaking tube. Packing has now been made standard for all of the thousand or so meters in plant.

(Silastic is a product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . . or for more information check CP 2365 opp. last page.)

NEW DESIGN FEATURES OF LEAKPROOF "CANNED" PUMP extend applications . . . SLASH PRICE 20-25%!



- New fabricated construction is simpler . . . permits mass production techniques. You benefit through lower cost.
- Construction materials include titanium, Monel, Carpenter 20, Hastelloy B, Teflon and stainless steels.
- 400% greater bearing area provides greatly extended service life. Bearings are semi-floating . . . easy to inspect or replace.
- Series S Chempumps give leak-proof service at heads to 94 feet, capacities to 50 gpm.

Fifteen years of design and operating experience are built into this new *low-cost* sealless Chempump.

You will benefit directly. You get the cost-saving advantages of mass production techniques. You get a choice of materials of construction that can handle practically any known corrosive. You get a "canned" pump that can't possibly leak, that requires no lubrication, that virtually eliminates maintenance. Oversized, semi-floating bearings give thousands of hours of service under difficult conditions . . . cut-outs provide fool-proof motor winding protection for both overcurrent and excessive heat.

The new Series S Chempumps will be available shortly in 1/3 and 3/4 horsepower sizes, with larger units coming. The price is competitive with a quality centrifugal equipped with a mechanical seal. Talk with the Chempump engineering representative in your area about saving through quantity purchases.

• For complete details, write for Bulletin 1030
CHEMPUMP CORPORATION
1300 E. Mermoid Lane, Philadelphia 16, Pa.

Chempump

**First in the field . . .
process proved**

When inquiring check CP 2366 opposite last page

Four compounds take their bow as —

chlorofluorocarbons offer unusual properties

Physical Properties of the Chlorofluorocarbons

Compound	Empirical formula	Mw	Boiling point (°C)	Freezing point (°C)	Density (gm/cc @ 20°C)	Specific heat	Latent heat of vaporization (cal./gm)	Coefficient of cubical expansion	Surface tension (dynes/cm @ 26°C)	Refractive index (n _D ²⁰)	Viscosity (centistokes @ 30°C)	Dielectric constant (@ 24.5°C)
2,3-Dichlorohexafluorobutene-2	C ₄ Cl ₂ F ₆	232.96	67	-67.3	1.6191	0.2	39.2	0.00160 (20-50°C)	16.1	1.3459	0.4277	2.10
2,2,3-Trichloroheptafluorobutene	C ₄ Cl ₃ F ₇	287.42	98	0	1.750	0.2	28.7	0.00132 (20-55°C)	17.8	1.3526	1.041	
2,2,3,3-Tetrachlorooctafluorobutene	C ₄ Cl ₄ F ₈	303.88	133	83	1.640 ¹	0.2	28.3	0.0014 (90-105°C)	16.0 ²		0.7150 ³	
1,2-Dichlorohexafluorocyclopentene-1	C ₅ Cl ₂ F ₆	244.97	90	-69.3	1.6507	0.2	34.2	0.00135 (20-55°C)	16.8	1.3676	0.513	13.0 ⁴

¹Density taken at 90°C
²Viscosity taken at 100°C
³Surface tension taken at 85°C
⁴Dielectric constant taken at 22°C

Stable compounds and derivatives are used as intermediates and also are used directly

Four chlorofluorochemicals take their bow this month as new tools for use in many applications where their unique properties, stability, and relatively low cost may be of advantage. Besides use as chemical intermediates, they have potential in many mechanical applications. In two of these compounds, the reactive double bond is the center of attack, and can be used to modify these compounds as well as synthesize new ones.

As these four chlorofluorochemicals step out on the chemical stage, we'll describe their features, each in turn:

2,3-Dichlorohexafluorobutene-2 — (US Patent 2,436,357) An intermediate in the preparation of a host

of compounds that have widely divergent properties. Some of these are chlorofluorocarbons, perfluorocarbons, fluorinated monomers, and derivatives of chlorofluoro and perfluoro acids. These should find application in the fields of plastics, refrigeration, textiles, paints, and protective coatings.

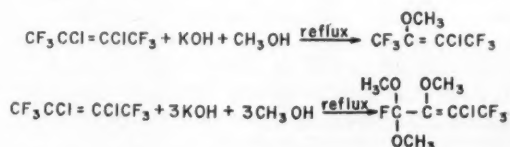
Physical properties of the clear, colorless liquid are given in the table: Compound can be a source for fluorochemicals containing functional groups, and also as the starting point for making many perhalogenated derivatives. Typical chemical reactions include:

1) Halogen exchange.

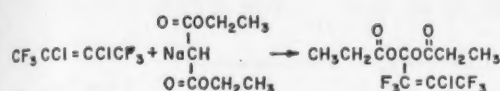


Product of the exchange is the starting point for a completely new series of chemicals. Hydrolysis of this compound gives dichloro trifluoro crotonic acid, from which a wide variety of reactive derivatives can be made.

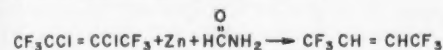
2) Reaction with alcoholic base is interesting.* The products have an ether linkage which should impart good viscosity index and improved lubricity characteristics to fluorochemicals.



3) It reacts also with the monosodium derivative of malonic ester.* Final product may have good VI, be a fire retardant, and may find use in elastomers.



4) By reduction with zinc and formaldehyde, monomers and comonomers are formed.*



5) Oxidation with KMnO_4 gives two mols of a salt of a perfluoro acid. (US Patent 2,414,706.)



6) Reaction with HF and Cl_2 in presence of pentavalent antimony at 250°C gives 2,2,3-trichloroheptafluorobutane, also available (see below).

Compound is soluble in many organics. It can be handled safely if adequate precautions are taken to avoid excessive inhalation and contact with both liquid and vapor. Inhalation toxicity results showed that 1240 ppm in air was fatal to rats exposed for one hour.

2,2,3-Trichloroheptafluorobutane — This clear, colorless liquid is potentially attractive for a variety of uses that require specialized properties, due to its unique combination of chlorine and fluorine. The high fluorine content and the perhalogenated nature of this compound give it good oxidation resistance. Its thermodynamic and electrical characteristics suggest applications as a coolant and refrigerant.

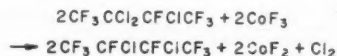
The three chlorine atoms on adjacent carbon atoms give a point for chemical attack, which gives interesting derivatives. Typical examples:

1) Reduction with zinc gives a compound analogous to the first compound discussed in this article.



This compound might also be polymerized.

2) Reaction with cobaltic fluoride gives other interesting series.



2,2,3-Trichloroheptafluorobutane is moderately toxic, and should be handled with precaution. Inhalation toxicity studies show that a concentration of 1800 ppm in air was not fatal to rats.

2,2,3,3-Tetrachlorohexafluorobutane — (US Patent 2,407,246) Having a chemical formula $\text{CF}_3\text{-CCl}_2\text{-CCl}_2\text{-CF}_3$, this compound has interest as a possible fumigant. Substitution of chlorine atoms by fluorine leads to a series of compounds with value as dielectrics, coolants, and refrigerants. Vapors of the white, waxy solid are classed as toxic. A lethal dosage was obtained by exposing rats to 190 ppm in air for one hour.

(Continued on next page)

For —
 ..good color stability
 ..improved oil solubility

try —
CARBIDE'S

MONO-, DI-, TRI-,
 AND MIXED

ISOPROPANOLAMINES

...as —

...intermediates for

- * DETERGENT BUILDERS
- * LATEX EMULSIFIERS
- * POLISH EMULSIFIERS

...stabilizers for textile resins

...solubilizers for casein

Try these isopropanolamines, too, in making preferred soaps for emulsifying "soluble" mineral oils. For additional information on these isopropanolamines and how they can make money for you write for technical data or consult a CARBIDE Technical Representative. Offices are located in 23 principal cities. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.



In Addition —

to these four isopropanolamines, you can get more than 80 other nitrogen compounds from CARBIDE. Among these products are mono-, di-, and tri-ethanolamines; dimethyl and diethyl ethanolamines and six morpholines. Write for technical data on these profit-making products.

CARBIDE
AND CARBON
CHEMICALS

Carbide and Carbon Chemicals Company
A Division of
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30 East 42nd Street New York 17, N. Y.

When inquiring check CP 2367 opposite last page

An ester solvent with a challenging potential



CELANESE* ETHYLENE GLYCOL DIACETATE

- S-L-O-W evaporating rate
- high boiling point
- high flash point
- colorless
- pleasant odor
- competitively priced

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Lacquers
Emulsions
Specialty Inks
Silk Screening
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Perfumes (fixative)
Transesterification

The services and facilities of the Celanese Technical Service and Applications Laboratories are available for your application development.

For additional information, samples, technical data, and prices, write: Dept. 591-L, Celanese Corporation of America, Chemical Division, 180 Madison Avenue, New York 16, N. Y.

physical properties

Boiling point, °C @ 760 mm.....	190.5
Dilution ratio with Toluene.....	1.8
Evaporation rate (n-butyl acetate=1.0).....	0.02
Flash point, Cleveland Open Cup, °F.....	205
Pounds/gallon, 68°F.....	9.2
Refractive index, 20°C.....	1.4150
Solubility in water, % weight @ 20°C.....	16.4
Solubility water in, % weight @ 20°C.....	7.0
Specific gravity, 20°/20°C.....	1.1063
Vapor pressure @ 20°C mm ² Hg.....	0.25
Viscosity, centipoises @ 20°C.....	2.86
Viscosity, 10% 1/2 second nitrocellulose solution, centipoises @ 25°C.....	444

specifications

Specific gravity, 20°/20°C.....	1.103-1.109
Distillation range, °C.....	186-195
Ester content, % minimum.....	97
Acidity, as Acetic, % weight, maximum.....	0.15
Color, APHA.....	15



*Reg. U.S. Pat. Off.

MATERIALS

CHLOROFLUOROCARBONS

(Continued from preceding page)

1,2-Dichlorohexafluorocyclopentene-1 — This compound may prove to be the most interesting of the quartet. In addition to its suggested uses as a coolant, dielectric fluid, and a selective solvent, it can be the beginning of a series, of fluorinated derivatives based on hexachlorocyclopentadiene. This latter compound is the basis for a number of well-known insecticides. A Diels-Alder reaction product of this same compound can be used to make chlorinated dibasic acids, which are the basis for a number of fire-resistant resins.

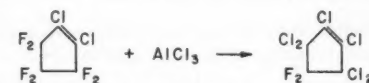
A number of highly fluorinated compounds containing functional groups can be prepared from this chemical. This interesting series should find application as monomers, coolants, dielectrics, and refrigerants. Some typical reactions are:

1) Oxidation with KMnO_4 gives the potassium salt of perfluoro glutaric acid, (US Patent 2,438,484) an intermediate for a variety of compounds such as acid halide, amide, esters, alcohols, and the anhydride. These derivatives should find use in making wetting agents, polyester resins, polyamide resins, hydraulic fluids, and elastomers.

2) Halogenation with CoF_3 adds fluorine to the unsaturated carbon atoms. Under the influence of light, Cl_2 adds chlorine at these carbons.

3) Reaction with an alcoholic base gives unsaturated compounds with ether linkage.*

4) Halogen exchange gives another interesting compound.



This compound can be handled safely with adequate precautions. A concentration of 2000 ppm in air is fatal to rats in one hour.

*From PhD thesis of K. A. Latif, Ohio State University, 1952.

(Chlorofluorocarbons are available in developmental quantities from Hooker Electrochemical Company, Dept. CP, PO Box 344, Niagara Falls, N.Y. . . . or for more information check CP 2369 on form opposite last page.)

Looking for a chemical raw material or intermediate? . . .

The alphabetical Product Directory (pages 218 to 220) will help you find it in a hurry. This listing, started by CHEMICAL PROCESSING in 1938, "puts the finger" on all subjects and products in editorial columns and advertisements of each issue.

► **CAREERS**...In Research, Engineering, Production and Sales.
Write Personnel Department "E" for a copy of "Celanese Careers."

When inquiring check CP 2368 opposite last page

CHEMICAL PROCESSING

U.S.I. CHEMICAL NEWS

Nov.-Dec.

★

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

★

1955

Polyethylene Coats Better When Applied As Liquid

High molecular weight polyethylene resins are reported to give excellent corrosion resistance when applied as coatings on metal surfaces.

Heat spraying equipment is available which reduces solid polyethylene to a low viscosity liquid before flame spraying so that coatings can be applied swiftly and uniformly at an average rate of 10 sq. ft. per minute. This method of application requires a target pre-heating temperature of 150-190°F, reportedly much lower than previous methods of application.

Resultant coatings meet strict U. S. Navy specifications for adhesion, porosity, corrosion, electrolysis, impact and thermal shock.

New AEC Sodium Handbook Now Available

The third edition of the *Liquid-Metals Handbook* was released on July 1 of this year by the Atomic Energy Commission and Department of the Navy. Designated as the *Sodium-NaK Supplement*, it is devoted entirely to liquid sodium and liquid sodium-potassium mixes (NaK). Subjects covered include: chemical and physical properties; heat transfer and chemical engineering; system design; components; safety and fire protection; and applications.

Also available: *Sodium Plumbing* by William B. Cottrell and Leland A. Mann—a review of unclassified research and technology involving sodium at Oak Ridge National Laboratories.

These books are highly recommended as supplements to U.S.I.'s own literature on handling of metallic sodium.

New Reforming Unit Assures Maximum U.S.I. Ammonia Production

At the U.S.I. ammonia plant — Tuscola, Illinois — a new Girdler reforming unit has just been completed as an alternate raw material source in the production of ammonia from natural gas. Until now the only raw material for U.S.I. ammonia manufacture has been hydrogen from the neighboring ethylene production facilities of subsidiary National Petro-Chemicals Corporation.

The new unit will supplement the available hydrogen when necessary to make it possible to operate the ammonia plant at full capacity at all times. This plant is rated at 50,000 tons per year.

Alkali Metals On Agenda At Spring ACS Meeting

A symposium on the "Handling and Uses of the Alkali Metals" is scheduled for the national spring meeting of the American Chemical Society in Dallas, April 9-13, 1956. Metallic sodium, potassium, lithium, etc. will come under discussion.

U.S.I. OPENS TWO NEW ALCOHOL DENATURING, DISTRIBUTION PLANTS

New Units At Newark, N. J. and Tuscola, Ill. Also Serve As Distribution Points For U.S.I. Solvents and Chemicals

Two new combination ethyl alcohol denaturing plants, bonded warehouses, and solvent distribution points have been added by U.S.I. during the past month. One is at Tuscola in central Illinois, the production point for U.S.I.'s synthetic alcohol; while the other at Newark, N. J., replaces a smaller denaturing operation a short distance away. These new plants, along with existing units at

New Orleans, La., Anaheim, Cal., and Chicago, Ill. permit overnight and often same-day emergency deliveries to alcohol and solvent users throughout most of the country. Integrated facilities at all locations can supply pure alcohol, denatured alcohol, SOLOX® proprietary alcohol solvent as well as other chemical solvents, in straight deliveries or mixed shipments in compartment tank cars, tank trucks, box cars and trucks.

The Newark plant has a 10 million gallon per year rated capacity, and is designed to handle the large tank truck volume in metropolitan New York and Northeast U. S. areas.

The Tuscola unit, designed to serve the Midwest with a flexible 12 million gallon per year capacity, is in the existing U.S.I. plant area where sulfuric acid, ammonia and nitrogen fertilizer solutions are produced. It is located next to subsidiary National Petro-Chemicals' manufacturing facilities for synthetic alcohol, ether, ethyl chloride, polyethylene and other petrochemicals.

Because these plants handle all denatured alcohol formulations, physical layout of the plant insures that only the required denaturants are present in any batch. This is accomplished by providing a separate line for each denaturant, and the use of 12 denaturing tanks. Gravity flow system insures complete

MORE

U.S.I. Offers Premixes, Feed Formulation Help

To keep pace with increasing demand of feed manufacturers for premixes, U.S.I. has expanded the scope of its nutritional services.

Vitamin and antibiotic supplements are usually added to the ration in small amounts — a time-consuming operation demanding careful attention, where slight measurement errors can prove costly. As a result, more and more feed manufacturers are buying USIMIX Premixes which contain vitamins, antibiotics, methionine and other additives in batch-size packages mixed to their specifications.

Also available: U.S.I. formulation service, offered to feed manufacturers on a confidential basis. U.S.I. will review feed formulations and offer suggestions.



New U.S.I. alcohol denaturing and distribution plant at Newark, N. J.

Nov.-Dec. ★

U.S.I. CHEMICAL NEWS

★ 1955

CONTINUED

Alcohol Units

drainage of all tanks and discharge lines. But with all of these built-in safeguards, chemical analysis of each batch is the final test. Years of application in other U.S.I. denaturing plants have proved the effectiveness of these methods of control.

Both plants have been designed to meet the pace of the fast-moving alcohol industry. Push-button control of the denaturing operation from a central control room permits quick preparation of formulas. Paper work delays are avoided by teletype connections between each plant and the U.S.I. sales divisions, a system which insures the best possible service for U.S.I. alcohol and solvent customers whose requirements were the governing factor in the design of these plants.

Permits, Bonds No Longer Needed On Sodium Ethylate

Purchasers of U.S.I. alcoholic solutions of sodium ethylate (15-20%) no longer need to file permit form 1485, nor do they need bonds to cover such purchases. The product can be sold only to firms using it in chemical processes and such firms will be required to submit to A&TTD, for approval, Form 1479-A in quadruplicate, stating the process and recovery and reuse of the alcohol.

Sodium ethylate is made by reacting sodium metal with anhydrous ethyl alcohol. U.S.I. supplies finished product and both raw materials.



National Distillers research laboratories in Cincinnati, O. New pilot building at right rear.

"U.S.I. Iseobacic" Acid First Project For New Cincinnati Pilot Plant

U.S.I. has just completed a new half-million-dollar pilot plant building at its research site in Cincinnati, Ohio. The new building provides 15,000 sq. ft. of versatile plant space, air-conditioned control laboratories, and the necessary utilities for final testing of processes and products developed by the U.S.I.-National Distillers Research Department.

The research program is aimed particularly at the development of new products and processes which integrate with other industrial chemicals produced by U.S.I. and subsidiary National Petro-Chemicals Corporation. First product to be piloted in the new research building is "U.S.I. Iseobacic" acid, which exemplifies this research goal in that it is derived from both sodium and petrochemical sources. Evaluation quantities of the new material will be turned out, and the process, originally piloted at another location, will be polished up. Samples are now freely available to all interested researchers.

Preliminary work indicates that polyurethane flex-foams will provide a major outlet for this new dibasic acid. When made from "U.S.I. Iseobacic" acid, these materials seem to have more uniform cellular structure and excellent elasticity.

In the vinyl resins field, evaluations of compounds plasticized with esters of "U.S.I. Iseobacic" acid show an unusually high resistance to extraction by soapy water and oil.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

New alkaline agent for stripping amodic coatings from aluminum eliminates waste disposal problem metal finishers encounter with acids. Water solutions at room temperatures remove average coatings by immersion only, in seconds. (No. 1120)

Spiral polyethylene tower packings now available show 140% increase in efficiency over other types, reduce packed height needed for separations. Liquid is held in interstitial spaces rather than on wetted surfaces. (No. 1121)

Edible gum for thickening water is now offered which gives viscosity of 3000 cp at 1% concentration, provides colloidal stabilization. One cent worth per pint makes a barely pourable solution, tasteless and odorless. (No. 1122)

New folder describes Flexspout® polyethylene closures on 5-gallon drums of U.S.I. ethyl alcohol USP, and U.S.I.'s proprietary denatured alcohol solvent SOLOX®. Illustrates how spout can best be opened and used. (No. 1123)

New organic brominating agent with 54% minimum bromine content now in commercial production. Costs less than other types, is somewhat more stable, and more reactive due to higher solubility in many organics. Gives high yields. (No. 1124)

Entirely new type of adhesive can be permanent or temporary, depending on requirements. Used for labeling polyethylene and other plastics, it replaces pressure-sensitive labels, can be applied by brush or existing machines. (No. 1125)

Specimens of 25 starches and condiments, on microscope slides, now available as standards in examining foods — and for quality control, research, litigation and criminology purposes. Hair and fiber specimens also available. (No. 1126)

Newly developed paper admits air, but resists passage of oil, water and other liquids. Manufacturer working on use possibilities. One suggestion — paper raincoats to shed water but keep wearer cool on hot days. (No. 1127)

New patent on sodium for making sodium cyclopentadiene listed as one of group of Ziegler patents on metal-organics now purchasable in translation. Patent gives 10 examples of convenient manufacturing procedures in detail. (No. 1128)

A polyethylene sink trap has been designed for laboratory use. This plastic resists acids, alkalis, fluorides and other chemicals; is physically tough and flexible. No tools required for installation, removal or replacing. (No. 1129)

PRODUCTS OF U.S.I.

ALCOHOLS:

- Ethyl Alcohol (Ethanol)—Specially denatured—all regular and anhydrous formulas. Completely denatured—All regular formulas for industrial use, anti-freeze. Pure alcohol—USP 190—Absolute, N.F., taxfree, taxpaid.
- Butanol (Normal Butyl Alcohol)—Latent solvent for nitrocellulose, solvent for ethyl cellulose, many resins, many chemical syntheses.
- Amyl Alcohol, Refined—Fine chemicals, pharmaceuticals.
- Fusel Oil, Refined—Blend of amyl alcohols refined by chemical treatment, distillation.
- Proprietary Denatured Alcohol Solvents
- SOLOX®—General-purpose.
- FILMEX®—Special, authorized for certain industries.
- ANSOL® M—Anhydrous, special blend for lacquers, resins, etc.
- ANSOL® PR—Anhydrous, special blend with higher ester content and solvency for lacquers, resins, etc.

PETROTHENE® Polyethylene Resins.

- Inorganic Chemicals: Ammonia, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sulfuric Acid.
- Esters, Ethers and Ketones: Normal Butyl Acetate, Dibutyl Phthalate, Diethyl Carbonate, Diethyl Oxalate, Ethyl Acetate, Ethyl Ether, Acetone.
- Intermediates and Fine Chemicals: Acetoacetylides, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate solutions, Urethan USP (Ethyl Carbamate).
- Animal Feed Products: Calcium Pantothenate, Choline Chloride Products, Curbay 8-G® 80, Special Liquid Curbay®, DL-Methionine, Nicotin USP, Riboflavin Concentrates, Vitamin B12 and Antibiotic Feed Supplements, Vacatone® 40, Vitamin A, Ds and Ks Products.
- Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Riboflavin USP, Urethan USP, Intermediates.

OTHER PRODUCTS:

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INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.

**Makes tertiary amines available
in commercial quantities
and in high purities . . .**

should be a shoo-in for many applications

Uses: As intermediates for making alkyl dimethyl benzyl ammonium chlorides to be used as germicides and fungicides and other quaternaries, as lube oil additives that act as scavengers and also increase wetting of surfaces by the oil, as activators of thiazole and thiuram in rubber production, and as catalysts in isocyanate foams.

Features: These tertiary amines are now in commercial production and are available with very high purities. This gives the user more of the active ingredient per pound and also makes a number of syntheses quite competitive.

Description: Part of manufacturer's Armeen® family, dimethyl alkyl tertiary amines in distilled grades contain a minimum of 92% tertiary amine, while the undistilled grades have at least 80% purity.

(Dimethyl alkyl tertiary amines are products of Market Development Dept., Chemical Div., Armour and Company, Dept. CP, 1355 W. 31st St., Chicago 9, Ill. . . . or for more information check CP 2370 on form opposite last page.)

**High adsorption capacity,
safe in contact with
food or drugs . . .**

dehydrating agent meets government specs
for packaging desiccant, static dehumidifier

Uses: Adsorption packaging desiccant and static dehumidifier for drugs, foods, or other materials which are damaged by moisture.

Features: Dehydrating agent can adsorb much larger amounts of moisture or water vapor in lower humidity ranges. It can be placed safely in direct contact with food and drugs.

Description: Material is a silica-type physical adsorbent and meets all government specifications for adsorption packaging desiccants and static dehumidifiers. It is packaged in ready-to-use unit bags.

(Humi-Sorb is a product of Desiccant Div., Culligan, Inc., Dept. CP, Northbrook, Ill. . . . or check CP 2371 on form opposite last page.)

For more information on product at left,
specify CP 2372 . . . see information re-
quest blank opposite last page.

SURFACTANTS

Alkane
(Basic material in manufacture
of surfactants)

Detergent Slurry

Detergent D-40

Detergent D-40SF

Detergent D-40FG

Detergent D-60

Wetting Agent S

Dispersant NI-W

Dispersant NI-O

BY THE WORLD'S LARGEST PRODUCER OF SYNTHETIC DETERGENT RAW MATERIALS

Have a problem that requires a detergent? A wetting agent? An emulsifier? A foaming agent? Whether you require the basic raw material or a surfactant in intermediate form or a finished product—it will pay you to investigate the complete Oronite line.

Oronite surfactants are priced competitively and have the high quality and uniformity you expect from the world's largest producer of synthetic detergent raw materials.

Why not talk over your needs with an Oronite detergent specialist? Write or phone the Oronite office nearest you.



*New! Alkane Technical Bulletin—available to those
interested in processing finished detergents from the
basic raw material.*



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200 Bush Street, San Francisco 20, California • 714 W. Olympic Blvd., Los Angeles 15, California
30 Rockefeller Plaza, New York 20, New York • 20 North Wacker Drive, Chicago 6, Illinois
Mercantile Securities Building, Dallas 1, Texas • Carew Tower, Cincinnati 2, Ohio

When inquiring check CP 2373 opposite last page

It pays to... Dry Natural Gas with Davison Silica Gel!

Data Proves That Silica Gel Is Best Drying Agent For Natural Gas

Field performance data shows that Davison Silica Gel is the superior drying agent for natural gas. No other drying agent offers all the advantages to be found in Davison Silica Gel.

- High capacity for moisture
- Resistance to fouling gives long desiccant life
- Economical to use because of fewer reactivations
- Dries to lower dew point
- High capacity at elevated temperatures—110-120°F.
- Excellent attrition resistance
- Low pressure drop

For detailed information and field performance data on the use of Davison Silica Gel for the drying of natural gas, write for Technical Bulletin No. 201.

Progress Through Chemistry

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.
Baltimore 3, Maryland

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLOUDES.
SOLE PRODUCERS OF DAVISON GRANULATED FERTILIZERS.

MATERIALS

Six chemical intermediates should find application in many products . . .

pharmaceuticals, insecticides, perfume materials, fine chemicals suggested for all six

Allylacetone, and unsaturated ketone with a terminal methyl group, should be a desirable intermediate for synthesis of pharmaceuticals, perfume materials, fungicides, insecticides, and other fine chemicals. Compound is water-white and has a purity over 99%. In distillation, 5 to 95% boils within a 128.5° to 129.5°C range. Sp gr @ 20°C is 0.841; refractive index @ 25°C is 1.4170. It is soluble in organics and sl. sol. in water. Mw is 98.08.

2,5-Dimethylhexadiene-2,4 is a symmetrical hydrocarbon containing a set of conjugated double bonds. It lends itself to a series of condensation reactions, and is suggested for the same applications as the above compound. Mw is 110.12. It is a water-white liquid with sp gr @ 20°C of 0.762 and refractive index @ 25°C of 1.436. 95% boils at 136.8°C.

2,5-Dimethylhexane-2,5-diol, a mildly aromatic white crystalline glycol, has a mw of 146.14 and melts at 88-89°C. Soluble in most organic solvents, the glycol contains two tertiary hydroxyl groups. It can be fully or partially dehydrated, cyclized with various amines, and fully or partially esterified. This and all the chemicals described here have the same suggested uses.

Ethyl α -allylacetoacetate has a purity of 92%+. The water-white liquid has the formula $C_9H_{14}O_3$ and an mw of 168.11. Sp gr @ 20°C is 0.989. Refractive index at 25°C is 1.436. IBP is 207.5°C, with 90% boiling at 218.5°C.

Ethyl chrysanthemumate (chrysanthemum monocarboxylic acid ethyl ester) is 97.2% pure. A pale yellow liquid, it is soluble in alcohols and ketones, insoluble in water. Mw is 196.28 and n_D^{20} is 1.4610. Compound's double bond reacts with halogens, ozone, hydrohalogen acids, sulfuric acid, nitrous anhydride, or nitrogen tetroxide. Modification of the ester group or additions to the double bond may provide useful cyclopropane derivatives.

Ethyl diazoacetate is an extremely reactive chemical which up to now has been handicapped in its commercial applications by its relative instability and handling hazards. Therefore manufacturer is making facilities available for synthesis of compound's various derivatives.

(Organic chemicals above are available in developmental quantities from Fairfield Chemical Div., Food Machinery and Chemical Corp., Dept. CP, 420 Lexington Ave., New York, N. Y. . . . or for more information about manufacturer's product, reader may simply check CP 2375 on form opposite last page.)

When inquiring check CP 2374 opposite last page

MATERIALS

Derived from acrolein: 1,5-pentanediol . . .

of particular interest are its esters and polyesters

This diol undergoes reactions typical of glycols: oxidation, dehydration, esterification, and acetalization. It forms esters and polyesters that are important intermediates in making polyester resins, urethane foams and elastomers, fibrous glass-reinforced resins, magnet and wire enamels, and other resinous materials.

Various esters have been suggested as plasticizers for vinyl polymers and such textile fibers as cotton, rayon, and wool.

It is also of interest to manufacturers of brake and hydraulic fluid compositions, emulsion breakers, lubricating oil additives, cosmetic preparations, insect repellent formulations, resin solvents, antifreeze solutions, and chemical intermediates.

(1,5-Pentanediol is a product of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. . . . or check CP 2376 opposite last page.)

Rare sugars, biologicals cataloged

Rare sugars, sugar derivatives, amino acids, and other biological chemicals are cataloged in 24-page pocket-sized bulletin. Specifications, container sizes, and prices are given. Among items of particular interest are: levulose, galactose, bilirubin, salicin, and calcium and sodium glucoheptonate.

"Price List" is issued by Pfanstiehl Laboratories, Inc., Dept. CP, 104 Lake View, Waukegan, Ill. Check CP 2377 opposite last page.

For more information on product at right, specify CP 2378 . . . see information request blank opposite last page.



Hopewell's On Stream

with important new production of

Adipic Acid

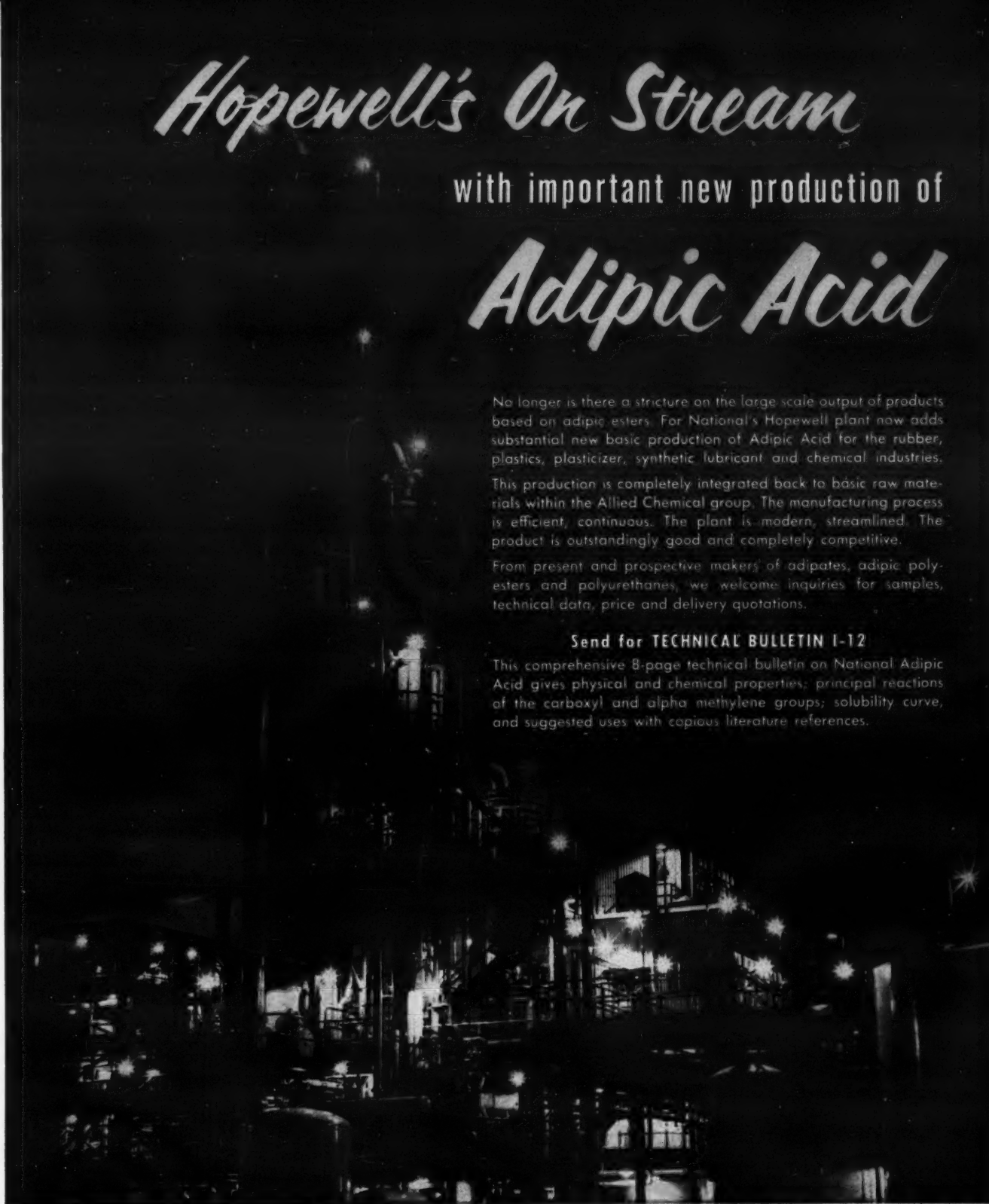
No longer is there a stricture on the large scale output of products based on adipic esters. For National's Hopewell plant now adds substantial new basic production of Adipic Acid for the rubber, plastics, plasticizer, synthetic lubricant and chemical industries.

This production is completely integrated back to basic raw materials within the Allied Chemical group. The manufacturing process is efficient, continuous. The plant is modern, streamlined. The product is outstandingly good and completely competitive.

From present and prospective makers of adipates, adipic polyesters and polyurethanes, we welcome inquiries for samples, technical data, price and delivery quotations.

Send for TECHNICAL BULLETIN I-12

This comprehensive 8-page technical bulletin on National Adipic Acid gives physical and chemical properties; principal reactions of the carboxyl and alpha methylene groups; solubility curve, and suggested uses with copious literature references.



NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.



Boston Providence Los Angeles San Francisco Portland, Ore. Greensboro Chattanooga
Philadelphia Charlotte Richmond Atlanta Chicago Columbus, Ga. New Orleans Toronto

FAMOUS LIGHTHOUSES OF AMERICA



TILLAMOOK ROCK LIGHTHOUSE is one of the most unusual on the Pacific Coast. Built in 1881, it is a stone structure standing on a small rock islet one mile off shore at Tillamook Head, Oregon. Because of its exposed position, in deep water and open to the sweep of the Pacific, it has received many violent batterings from stormy seas. Occasionally waves break completely over the lantern itself, 133 feet above sea level. Landing is made only by hoisting from a boat.

Freedom From Risk in the choice of electrochemicals is provided by Niagara Alkali Company's modern production facilities and by its extremely rigid quality control methods. Rely on Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

60 East 42nd Street

New York 17, N.Y.

MATERIALS

Cuts costly rubber mold cleaning operations . . .

silicone emulsion mold release gives quality finish

Uses: As a mold release compound.

Features: Designed specifically to minimize rubber mold cleaning operations. Agent gives efficient mold release and imparts a high quality finish to rubber products. It is particularly suited for white and light-colored goods.

Description: Poly-Cone 1000 is a modified silicone emulsion containing 38% active ingredients. It is effective on conventional mold metals, including aluminum.

(Silicone mold release is a product of National Polychemicals, Inc., Dept. CP, Eames St., Wilmington, Mass. . . . or for more information check CP 2379 on form opposite last page.)

Develops a soft amorphous-type silica . . .

of special interest to paint, varnish makers

Uses: In production of paint and varnishes.

Features: In addition to increased surface area, silica has a low pH value, higher oil absorption, and low particle size.

Description: Soft, amorphous-type silica has a particle range of 1 to 15 microns (with 98% minus 10 microns).

(Dustex Micro-Silica is a product of Tamms Industries, Inc., Dept. CP, 228 North LaSalle St., Chicago 1, Ill. . . . or for more information check CP 2380 on form opposite last page.)

For more information on product at left, specify CP 2381 . . . see information request blank opposite last page.

Good low-temperature in poly

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Uses:

Features: handle
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Uses: waxes.

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**Good electrical insulation properties,
low-temperature characteristics
in polymeric vinyl plasticizer . . .**

being a liquid, it goes on the mill easily

Uses: As a polymeric plasticizer for vinyl resins.

Features: Being a liquid, it is much easier to handle and gives a lighter colored vinyl stock. Finished vinyl product is almost inert to action of oil, gasoline, soapy water, and air. Low-temp properties are good and the plasticizer has very high electrical insulation characteristics.

Description: The high-mw polymeric plasticizer is a water-white liquid. It goes on the mill almost like a monomeric plasticizer. When compounded at 50 phr in vinyls, the cured product has these typical properties:

Tensile (psi)	2800
Elongation (%)	235
Shore hardness	90
Brittle point (°C)	-15
Volume resistivity (ohm-cm x 10 ¹¹)	0.68
SIR (megohms-1000' @ 60°F)	56,000
SIC	5.8
Power factor (%)	10.2

(Morflex P-50 is a product of Morton-Withers Chemical Co., Dept. CP, PO Box 1618 Greensboro, N.C. . . . or for more information check CP 2382 on form opposite last page.)

**Couples high solids concentration
with fine particle size to make
better self-polishing wax . . .**

formulations require less plasticizer, yet form films that are more flexible

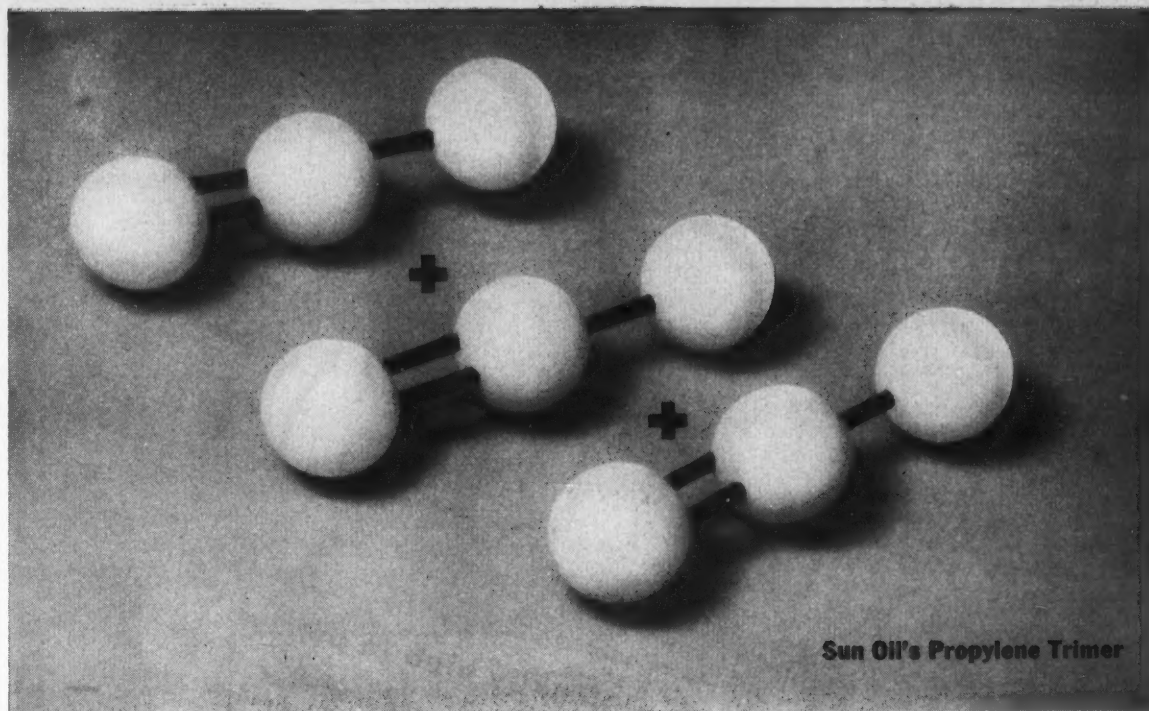
Uses: For the preparation of self-polishing floor waxes.

Features: In addition to an extremely fine particle size, emulsion contains a high concentration of solids. Formulations require less plasticizer than emulsion's predecessor, U-2001. Films that are formed are also more flexible.

Tests show that gloss is maintained for a longer time than with U-2001, and that wear- and scuff-resistance are improved. The newer emulsion also provides better leveling and has superior freeze-thaw stability.

Description: Called U-2002, compound is a modified polystyrene emulsion. No drop in pH of diluted or undiluted emulsion was observed over a 60 day period at 50°C.

(Modified polystyrene emulsion is a product of Union Bay State Chemical Co., Inc., Dept. CP, 491 Main St., Cambridge 42, Mass. . . . or for more information check CP 2383 on form opposite last page.)



YOU GET CONSISTENT UNIFORMITY FROM SUN OIL'S PROPYLENE TRIMER

Consistent uniformity of Sun's propylene trimer eliminates color problems in end products...makes it give particularly excellent results in alkylation reaction with aryl groups in the production of synthetic detergents.

Of special interest to chemists in many other fields is the fact that butylenes are eliminated from Sun's propylene trimer. It is almost entirely mono-olefinic...averaging 99.5%. The distribution of the olefin types in propylene trimer is indicated as follows:

Terminal Olefins:

$R-CH=CH_2$	5%
$R_1 > C=CH_2$	12

Non-terminal Olefins:

$R_1 > C=C < \begin{matrix} H \\ R_2 \end{matrix}$ (trans)	16
$R_1 > C=C < \begin{matrix} H \\ R_2 \end{matrix}$ (cis)	5
$R_1 > C=C < \begin{matrix} R_3 \\ H \end{matrix}$	46

Remainder:

16
(Presumably tetra-substituted olefins)

For other information, see your Sun representative, or write for Technical Bulletin #20. Address
SUN OIL COMPANY, Philadelphia 3, Pa., Dept. CP-12.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY, PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

Typical Specifications

API Gravity @ 60 F.	57-61
Specific Gravity	0.7351-0.7507
Distillation, 5%	265 F min
95%	275-305 F
Sulfur, wt. %	0.02 max
Bromine Number	135 min
Color, Saybolt	21 min

SUN OIL IS A MAJOR PRODUCER OF:

Benzene • Toluene • Mixed Xylenes • Propylene Trimer and Tetramer • Sunaptic Acids (High Molecular Weight Naphthenic Acids) • Sulfonate WS (Water Soluble Sulfonate) • PDO-40 (Polymerized Drying Oil)



When inquiring check CP 2384 opposite last page

MATHIESON

FORMALDEHYDE



Exceptionally high in purity

Mathieson Formaldehyde meets the most critical specifications for purity and uniformity. It is especially low in formic acid and iron content. The following grades are available:

- 37% inhibited
- 37% low methanol
- 45% low methanol
- 50% low methanol

Mathieson Formaldehyde is shipped in 8,000-gallon tank cars and in tank trucks from Morgantown, West Virginia. To check an actual production sample against your requirements, call or write today.

MATHIESON CHEMICALS
OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

2903-B



ETHYLENE OXIDE • ETHYLENE GLYCOL • DIETHYLENE GLYCOL • TRIETHYLENE GLYCOL • POLYGLYCOLS • DICHLOROETHYLENE
ETHYLENE DICHLORIDE • METHANOL • SODIUM METHYLATE • ETHYLENE DIAMINE • CAUSTIC SODA • SODA ASH • CHLORINE • SULPHURIC ACID
SULPHUR • AMMONIA • NITRATE OF SODA • BICARBONATE OF SODA • CARBON DIOXIDE • SODIUM CHLORITE • CALCIUM HYPOCHLORITE

2903

When inquiring check CP 2385 opposite last page

MATERIALS

Makes fibers, molding powders, film, and coatings:
 ϵ -caprolactam . . .

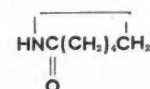
capable of self-polymerization, copolymerization

Uses: This raw material is used in manufacture of fibers, molding powders, leather finishing compositions, film, and coatings. Possessing two reactive groups, it is also a potential source of a wide variety of other products.

Features: Compound is capable of both self-polymerization, and combination with other substances to give various copolymers, which vary in mw and properties with substance used. A high mw product can be used to make synthetic leather. Polymers with an mw <1000, obtained by heating to 250°C with a secondary amine, are used as plasticizers, thermal-setting plastics, or intermediates for resins by reaction with formaldehyde, paraformaldehyde, acrolein furfural, adipic acid, or sebacic acid.

A good paint vehicle is formed when 85 parts of the compound condense with 124 parts of phthalic acid, 74 parts phthalic anhydride, and 84 parts of trimethylolpropane to yield products without gelation and that have much lower acid values than corresponding alkyd resins.

Description: epsilon-Caprolactam has the formula:



The white crystals have these properties:

Melting point (°C)	68-69
Density (70% aq soln)	1.05
Refractive index (n_D^{20})	1.4935
Bulk density (gm/cc)	0.6-0.7
Heat of fusion (cal/gm)	29
Heat of vaporization (cal/gm)	116
Heat of polymerization (cal/gm-mol)	20,000
Viscosity (cp @ 78°C)	9

Reaction with anhydrides of monobasic acids give N-acyl derivatives. With phthalic anhydride, a dibasic acid, 1-*o*-carboxybenzoyl-2 oxohexamethylenimine is formed.

ϵ -Caprolactam adds to olefins by transfer of the active hydrogen attached to the nitrogen. Stoichiometric quantities of the compound and alkyl sulfates react to yield O-alkyl- ϵ -caprolactam. A sulfate is formed by reaction with H_2SO_4 in CCl_4 .

Sodium and ethanol reduce it to hexamethylenimine. ϵ -Aminocaproic acid is formed by hydrolysis with superheated water. Paraformaldehyde and isocyanates also react with ϵ -caprolactam.

(ϵ -Caprolactam is a product of National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. . . . or for more information check CP 2386 on form which is located opposite last page.)

Having problems with "fish eyes" in polyvinyl acetate paints? . . .

manufacturer states that this defoaming agent should cure them

Uses: As a defoaming agent for polyvinyl acetate-base paints.

Features: Defoamer has been developed for applications where "fish eyes" are a problem. It is free of this tendency. In addition, defoamer need not be ground in, but may be premixed with one of the constituents or dispersed directly into the paint at any time during the formulation. It is completely stable in storage.

Description: A clear, light-colored liquid, defoamer has these typical properties:

Freezing point (°C)	—6
Boiling range (@ 2.5 mm, 10-90% range, °C)	180-260
Flash point (°C)	185
Sp gr (25°/4°C)	0.97
Free fatty acid (%)	0.3
Viscosity (cp @ 25°C)	16½
Color (Lovibond 5¼")	11Y, 2.5R max

Formulas with 0.3 to 0.5% have been found most successful, but amount should be determined for each specific system.

(Eldefoam 400 is a product of El Dorado Division, Foremost Food & Chemical Co., Dept. CP, PO Box 599, Oakland 4, Calif. . . . or for more information check CP 2387 on form opposite last page.)

Analytical need of flame photometry served by calcium carbonate primary standard . . .

also can be used for Versene titrations

Calcium carbonate primary standard was developed to serve the analytical requirements of flame photometry and Versene chelating agent titrations. It provides an ideal calcium standard, especially for these uses. Purity of material is indicated by following analysis:

Test	Specification
Appearance	Fine, white powder
Odor	none
Sulfates (% max)	0.005
Chlorides (% max)	0.001
Nitrates (% max)	0.10
Heavy metals (% max)	0.001
Assay (% CaCO ₃)	99.95—100.05

(Calcium carbonate AR primary standard is product of Mallinckrodt Chemical Works, Dept. CP, 2nd & Mallinckrodt St., St. Louis 7, Mo. . . . or for more information check CP 2388 on form opposite last page.)

Cut your materials costs with
PICCOPALE



completely new
100% petroleum
polymer,
versatile,
compatible,
permanent,
low cost

Technical Service



Pennsylvania Industrial Chemical Corporation operates an exceptionally well-equipped laboratory for technical research involving the use and application of Pico products.

The extremely low cost of PICCOPALE, and its availability in enormous quantities make this new type of petroleum resin ideal for use as a basic raw material. It is chemically inert—not affected by acids and alkalis; moisture-proof; compatible with waxes, rubbers, polyethylene, coumarone-indene resins, phenolics, rosins, many alkyds, vinyls, drying oils and many other materials; soluble in naphthas, chlorinated and other solvents. Available in liquid solution or in flaked or solid form. WRITE for complete data, specifications and samples.

Pennsylvania Industrial Chemical Corp. CP
Clairton, Pennsylvania
Please send bulletin describing PICCOPALE and samples of grade for (application) _____

Name _____ Position _____
Company _____
Address _____

Pennsylvania Industrial Chemical Corp.
Clairton, Pennsylvania
Plants at:
Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.
District Sales Offices:
New York, Chicago, Philadelphia, Pittsburgh, Detroit

When inquiring check CP 2389 opposite last page

**Where can you
use these
high-purity chemicals?**

Ammonium Paratungstate	Phosphotungstic Acid
Barium Carbonate	Potassium Silicate
Calcium Carbonate	Silicon
Germanium	Sodium Sulphate
Germanium Dioxide	Sodium Tungstate
Molybdenum	Strontium Carbonate
Phosphors,	Tungstate Acid
(TV tube,	Tungstic Acid
CR tube, lamp)	Tungstic Oxide

Write for technical information

SYLVANIA ELECTRIC PRODUCTS INC.
1743 Broadway, New York 19, N. Y.
In Canada: Sylvania Electric (Canada) Ltd.
University Tower Bldg., St. Catherine St., Montreal, P. Q.



When inquiring check CP 2390 opposite last page

THE 'T' PRODUCTS

are inert, brilliantly white, finely divided, inexpensive pigments designed and specifically treated for use in

AQUEOUS SYSTEMS

They disperse completely under mild agitation at

75-80% SOLIDS

to form flowable, homogeneous pastes of low viscosity. For use in

- LATEX COMPOUNDS
- FOAMED LATEX
- EMULSION COATINGS
- ADHESIVES
- PAPER COATINGS
- INSECTICIDES

Dept. C, Calcium Products Division, The Georgia Marble Co., Tate, Georgia
Please send me free data and samples of the T products.
Name _____
Firm _____
Address _____
City _____ State _____

CALCIUM PRODUCTS DIV.
THE GEORGIA MARBLE CO. • TATE, GA.

When inquiring check CP 2391 opposite last page

High purity alkanolamides

enhance properties of surface-actives

Fatty acid diethanolamine condensates in virtually pure form combine excellent wetting, penetrating, foaming, and dispersing properties — improve detergency properties of other surface-active agents

CHEMICAL AND PHYSICAL CHARACTERISTICS SUPER-AMIDE FATTY ACID ALKANOLAMIDES

Physical state	crystalline solid L-9	viscous liquid GC	viscous liquid GR
Melting point (°C)	approx. 45	—	—
Color	pale straw	amber	straw
Concentration (min % alkanolamide)	90	75	80
pH (1% aqueous soln)	8.5-9.0	8.5-9.0	8.5-9.0
Sp gr (@ 25°C)	0.995*	0.999	0.998
Density (lb/gal)	8.30	8.33	8.32

* @ 50°C

Uses: In textile compounds as detergents, foam stabilizers, and dyeing assistants; in industrial cleaners as detergents and wetting agents and viscosity builders; in buffing and polishing compounds as wetting and dispersing agents and thickeners; and as wetting and dispersing agents, foam builders, and stabilizers, viscosity builders, and detergents in household cleaning compounds, shampoos, and bubble bath compounds.

Features: Containing up to 50% more amide than alkanolamine fatty acid condensates heretofore commercially available, the alkanolamides have high activity. The virtual absence of uncombined diethanolamine makes neutralization of the base unnecessary and thus avoids presence of electrolytes in final product. Furthermore, reduction

of the amount of fatty acids and soaps improves stability in hard water with a consequent improvement of foam. Detergency properties of other surface-actives are also enhanced.

Elimination of amino esters and amido esters as well as the piperazine derivatives presumably allows the full utilization of the foam-stabilizing effect of the alkanolamide. Manufactured from high-purity raw materials by improved methods, odors that were formerly associated with the alkanolamides are practically eliminated.

When used in combination with other surface-active agents, they impart outstanding thickening properties. They are particularly well adapted for use with fatty alcohol sulfates, alkylaryl sulfonates, and the nonionics.

Description: Super-Amides are fatty acid diethanolamine condensates containing up to 95% pure alkanolamide. They are supplied in three grades, with properties shown in the table. The products form clear gels in water at concentrations above 10-15%.

At lower dilutions they form hazy solutions or dispersions. Addition of small quantities of anionic or nonionic surface-active agents will bring complete solubility at these low concentrations and enhance wetting properties. Compounds are soluble in toluene, benzene, alcohols, glycols, chlorinated solvents, and Stoddard solvent. They are insoluble in mineral oil and kerosene.

A typical formulation for a car wash compound:

Maprofix TLS-500 or 513*	12.0%
Super-Amide GC	3.5
Neutronyx 600**	3.5
Water	81.0

* Onyx Oil's triethanolamine lauryl sulfate
** Onyx Oil's alkylphenol polyglycol ether

Dissolve the ingredients in water in order given. Warm gently while agitating until clear.

A typical textile scouring compound would be:

Maprofix WAQ*	50.0%
Super-Amide GR	6.0
Water	44.0

* Onyx Oil's sodium lauryl sulfate

Dissolve the Maprofix WAQ in the water and warm to 60-70°C while agitating the solution. Add Super-Amide GR and continue agitation until a clear, viscous solution is obtained.

(High-purity alkanolamides are products of Onyx Oil & Chemical Co., Dept. CP, Warren & Morris Sts., Jersey City 2, N. J. . . or for more information check CP 2392 on form opposite last page.)

Wide variety of reactions possible with thiophene should raise demand

Uses being developed in plastics, resins, and photographic chemicals

Uses: Principal present use of thiophene is in manufacture of dyes and pharmaceuticals and in agricultural chemicals. However, chemical is expected to be used in plastics, rubber, resins, and photographic chemicals.

Features: Thiophene is a highly versatile heterocyclic sulfur compound, C_4H_4S , which undergoes a wide variety of reactions. Both initial commercial and semi-commercial uses as well as new developments are now under research throughout the chemical industry, and show promise of developing a larger demand for the compound. The prospects at the present time are good for successive reductions in price of thiophene from its present specialty level, should the demand continue to develop.

Description: Reactivity of thiophene is similar in many respects to that of phenol, benzene, and certain unsaturated hydrocarbons. Compound is readily nitrated, halogenated, alkylated, metalated, acylated, aminated, and undergoes condensations with formaldehyde and maleic anhydride.

Manufacturer's subsidiary company, Index Chemicals in Houston, Texas, is now in regular commercial production. Index operates process under license from Socony Mobil Oil Company. An unusually high quality product is yielded from the butane and sulfur starting materials. Physical properties of thiophene are shown in the table:

Physical form	clear liquid
Purity (min mol %)	98.0
CS ₂ content (max %)	0.6
Engler distillation @ 760 mm:	
(98% between, °C)	83.0 to 85.0
Sp gr (25°/4°C)	1.056 to 1.059
Refractive index (n _D ²⁰)	1.5247 to 1.5267
Flash point (°F)	below 30

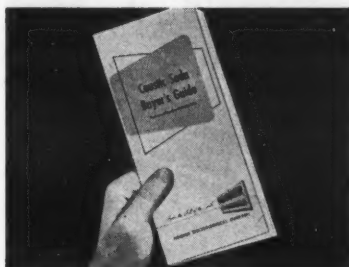
At the present time, manufacturer has no specific production plans for any one product derived from thiophene. However, manufacturer points out that under arrangements with Socony Mobil Oil Company, a substantial amount of technical data is now under review by manufacturer's research and development people. They expect that in the future they will undertake manufacture of products based on thiophene.

(Thiophene is a product of Sharples Chemicals Division, Pennsylvania Salt Mfg. Co., Dept. CP, 3 Penn Center Plaza, Philadelphia 2, Pa. . . . or for more information check CP 2393 on form which is located opposite last page.)

BRIEFS

for buyers of

Caustic Soda
Muriatic Acid
Aluminum Chloride



What strength caustic should you buy?

This new booklet gives facts every buyer should know about caustic soda.

It contains a handy nomograph to help figure for yourself whether 50% or 73% caustic is your better buy.

Contents include a list of reasons *pro* and *con* switching to 73% caustic if you are now using 50%. There's a factual discussion of the economics of 73% vs. 50%.

The booklet also contains a nomograph for estimating your liquid caustic requirements for various process solution strengths; a table showing dimensions and capacities of the different containers in which Hooker caustic soda is shipped; and a list of points to look for when you're choosing a caustic soda supplier.

Check the coupon at right for your copy (or write us if you'd like more than one).

High-purity HCl.

Probably the purest muriatic acid you can buy in volume anywhere is Hooker White.

This special-grade muriatic is entirely free of arsenic. It contains .003%

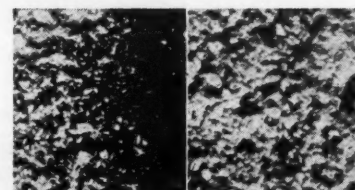
or less sulfates, and .0001% or less iron.

Leading pharmaceutical firms are among those who specify Hooker White when they want a highly pure starting material.

If your requirements are slightly less stiff, we recommend Hooker commercial grade muriatic. This grade is entirely arsenic-free, and has very low sulfate and iron content.

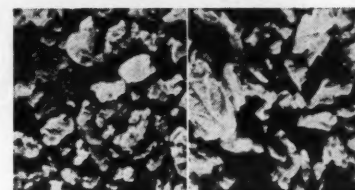
Both grades are available in 18°, 20°, and 22° Baumé. Muriatic acid is shipped in rubber-lined tank cars and 13-gal. glass carboys.

For technical data sheets, check the coupon.



EXTRA FINE GRIND

FINE GRIND



COARSE GRIND

COARSE SCREENED

Catalyst control.

Surface area of a solid catalyst, such as aluminum chloride, of course bears an important relationship to reaction rate.

That's why we make aluminum chloride in four different mesh sizes (shown above, actual size). You can

get close control of reaction and feeding rates by specifying, from the following list, the size that best fits your process:

1. Extra fine grind (90-95% through 40 mesh).
2. Fine grind (almost all through 20 mesh).
3. Coarse grind (through 1 mesh, 25-35% through 20 mesh).
4. Coarse screened (through 1 mesh, on 20 mesh).

This material is a grayish crystalline solid containing 98.5% $AlCl_3$ in coarse sizes, 97.5% in fine sizes, with maximum iron content of 0.05%.

It is shipped in the following containers:

5-gal. pails	50 lbs. net
10-gal. removable head drums	100 lbs. net
55-gal. removable head steel drums	550 lbs. net

For technical data, check the coupon.

For more information

on items mentioned here, check below.

- ☐ Aluminum Chloride, anhydrous
- ☐ Caustic Soda, liquid (50% and 73%)
- ☐ Muriatic Acid

Do you process with any of these compounds? The list below is only partly representative of high-quality materials available in quantity at Hooker. Check those on which you'd like more information.

- ☐ Antimony Trichloride, anhydrous
- ☐ Benzotrichloride
- ☐ Benzoyl Chloride
- ☐ Benzyl Chloride
- ☐ Benzyl Thiocyanate
- ☐ Butyryl Chloride
- ☐ Caprylyl Chloride

Clip and mail to us with your name, title, company address.



1905—Half a Century of Chemicals

From the Salt of the Earth—1955

HOOKEE ELECTROCHEMICAL COMPANY

8-1793

15 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.
NIAGARA FALLS • TACOMA • MONTAGUE, MICH. • NEW YORK • CHICAGO • LOS ANGELES

When inquiring check CP 2394 opposite last page

keeping up with

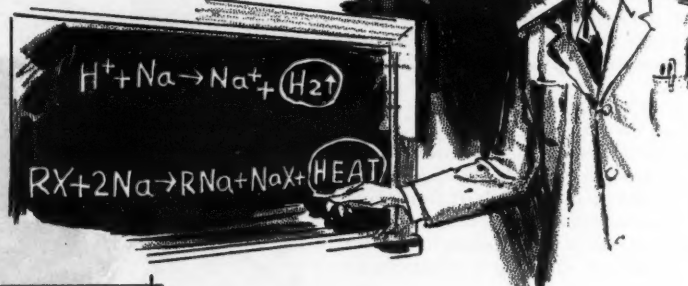
SODIUM

**278,000,000,000
PARTICLES
PER POUND!**

DISPERSE A POUND OF SODIUM IN INERT HYDRO-CARBON MEDIA AT A PARTICLE SIZE OF 15 MICRONS AND YOU'VE GOT 278 BILLION SEPARATE PARTICLES—A TREMENDOUS, HIGHLY-ACTIVE SURFACE AREA. MANY A REACTION, TOO SLOW FOR COMMERCIAL CONSIDERATION BEFORE U.S.I. DEVELOPED SODIUM DISPERSIONS, NOW FINDS READY ACCEPTANCE AS A FULL-SCALE PLANT PROCESS—WITH HIGH YIELDS AND REMARKABLE EASE OF CONTROL. EVEN GREATER SURFACE AREA CAN BE OBTAINED BY COATING SODIUM ON INERT FREE-FLOWING SOLIDS, ANOTHER U.S.I.-DEVELOPED TECHNIQUE.

Heat? Hydrogen? Everything's Under Control

NEW SODIUM FORMS DEVELOPED BY U.S.I. (SEE ABOVE) HAVE PRACTICALLY ELIMINATED CONTROL PROBLEMS IN SODIUM REACTIONS. BECAUSE THESE NEW FORMS PERMIT BETTER CONTROL OF REACTION RATE, THEY MAKE POSSIBLE A STEADY, UNIFORM REMOVAL OF HEAT FROM THE SYSTEM AND EASY TEMPERATURE CONTROL. A NITROGEN PURGE IS USED TO EXCLUDE AIR SO THAT ORGANIC VAPORS OR RELEASED HYDROGEN CANNOT BE IGNITED.



NEW WAY TO MAKE CATALYSTS HIGH-PURITY METALS...OR WHAT?

SINCE THE DEVELOPMENT OF SODIUM COATED SOLIDS BY U.S.I., HIGH YIELDS OF FINELY-DIVIDED TITANIUM, ZINC, IRON, COPPER, NICKEL, PLATINUM, ETC., HAVE BECOME POSSIBLE—NEW PROCESSES HAVE BECOME FEASIBLE ON A COMMERCIAL SCALE. SODIUM DISPERSIONS, TOO, HAVE BEEN USED TO REDUCE CERTAIN METAL SALTS. HIGHLY PURE METALS AND CATALYSTS CAN BE READILY PRODUCED. CAN YOU THINK OF OTHER APPLICATIONS?

SEND FOR U.S.I. BROCHURES ON SODIUM—SEE U.S.I. FOR HELP ON YOUR SODIUM REACTIONS

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

When inquiring check CP 2395 opposite last page

MATERIALS

**Commercial-scale production
of meta-xylene in purity
of over 95% . . .**

material is essentially free of non-aromatics

Uses: As a chemical intermediate which should find many applications.

Features: A high-purity product is offered on a commercial basis. In general, the material is essentially free of non-aromatic hydrocarbons.

Description: meta-Xylene of 95% purity has these typical inspection tests:

Sp gr (60°/60°F)	0.8649
Color (Saybolt)	+27
Acidity	None
Flash point (Tag open cup, °F)	92
Sediment	None
Boiling range (°C)	
Start	138.5
DP	141.5
Water and sulfur (as H ₂ S or SO ₂)	None
Cloud point (@ 30°C)	Nil

(meta-Xylene is a product of Oronite Chemical Co., Dept. CP, 200 Bush St., San Francisco 20, Calif. . . . or for more information check CP 2396 on form opposite last page.)

**Anti-caking, bulking, absorption uses
seen for this low-particle size
synthetic calcium silicate . . .**

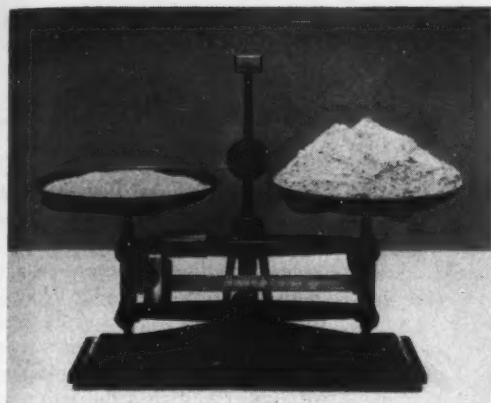
remains free-flowing powder even when it absorbs 1 to 2½ times its weight of liquids

Uses: For absorption of liquids, viscosity control, and as an anti-caking agent in fertilizers, insecticide dusts, cleansers, and detergents. It is also a bulking agent, pigment extender, suspension agent, flattening agent, reinforcing pigment, and an absorbent-grinding aid for high liquid concentrate insecticide wettable powders. Application in foods may also be in the future.

Features: Material can absorb 1 to 2½ times its weight of liquids and still remain a free-flowing powder. This, coupled with extremely fine particle size, gives it anti-caking properties and insures flowability even after product storage. Uniform blends are made quickly and without segregation. Viscosities as heavy as a paste can be made by addition of relatively small quantities.

Among the high concentrate wettable powders which have proven commercially practical are 70% Toxaphene, 15% Aramite, 75% DDT, 50% Heptachlor, and 75% Dieldrin. Dry dust concentrates which have been proven commercially practical are 70% Toxaphene, 50% Aramite, and 50% Heptachlor. Savings in handling and transportation costs can be realized using this material.

Description: This line of synthetic calcium silicates is produced by chemical combination of lime



High bulking value of synthetic calcium silicates (rt.) compared to equal weight of clay (l.)

and diatomaceous silica. Powder is available in specific grades which offer a range of properties:

Absorption (% by wt)	
Water	300-600
Oil	275-500
Bulk density (lb/cu ft)	5-15
Ultimate particle size (μ)	0.02-0.07
pH	8.0-10.0
Moisture (free, % by wt)	5-8
Refractive index	1.52-1.55
Available surface area (sq M/gm)	95-175

A white to off-white powder, product is available in developmental scale.

(Micro-Cel is a product of the Celite Division, Johns-Manville, Dept. CP, 22 E 40th St., New York 16, N.Y. Check CP 2397 opp. last page.)

Greater rigidity, heat resistance for polyethylene through patented catalyst . . .

reduced fluid permeability permits wider use in industrial piping applications

Uses: Fabrication of industrial piping and other products formerly considered not feasible with polyethylene.

Features: Product has greater rigidity and heat resistance than conventional polyethylene. Fluid permeability has been decreased.

Description: Patented Ziegler catalyst allows polymerization of ethylene to give a high molecular weight polyethylene with these improved properties. It will be available, in limited tonnages, early in 1956.

(Hyfax polyethylene is a product of Cellulose Products Dept., Hercules Powder Co., Dept. CP, Wilmington 99, Del. Check CP 2398 opp. last page.)

6 MONTHS IN STORAGE ... NO PEROXIDE BUILD-UP!

TWO different lots of Swift's DP Stearic Acid were put under storage conditions for six months. Here is how each lot tested at the end of that time:

Peroxide Value
(Original)
Peroxide Value
(6 Months Later)

NIL

NIL

LOT 1576

SWIFT'S

NIL

NIL

LOT 1633

SWIFT'S

SWIFT'S STEARIC ACID for lasting product freshness

Peroxide value is a measure of oxidation. Where stearic acid is involved, oxidation is an enemy to the shelf life of your product. The results of the test shown above were important to us for two reasons and should be of equal interest to you for the same reasons:

(1) *Swift's Double Pressed Stearic Acid resists oxidation over extended storage.* It is shipped fresh to stay fresh and to help insure the stability of your product.

(2) Results of a ten week accelerated storage test carried out under identical conditions using fresh samples of DP stearic acid produced by five manufac-

turers showed the Swift's product to have the *lightest color and greatest storage stability of all samples tested.*

"Application" purity is no accident with Swift's Stearic Acids. Only the better suited grades of raw materials are selected from the wide variety available to us for processing in a unique low temperature solvent process. With it, impurities and color bodies are selectively extracted. Low ash, light color, bland odor, and true product freshness and stability are the result.

Write for details today—and remember . . .
ONE TRIAL IS BETTER THAN A THOUSAND CLAIMS



USE THIS COUPON FOR FURTHER INFORMATION

Swift & Company, Industrial Oil Dept.
1830 165th Street
Hammond, Indiana

O-18

Please send further information on Swift's Stearic Acid for use in:

☐ Send Industrial Oil Bulletin.

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

When inquiring check CP 2399 opposite last page

*From National Aniline
at Hopewell, Va.
Substantial New
Basic Production of*

CYCLOHEXANONE

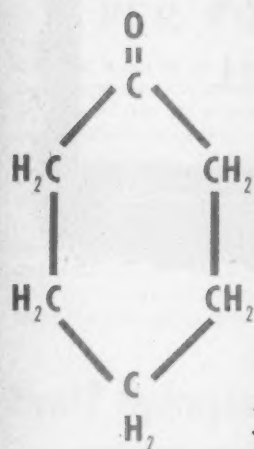
These simple facts about our new Cyclohexanone output at Hopewell, Va. should interest every present and potential user of cyclic ketone solvents:

It is the highest-quality, volume-production Cyclohexanone yet to be offered. Cyclohexanone content is 99.0% minimum.

It is a completely dependable source of supply, being integrated right back to basic raw materials within the Allied Chemical group.

It is now freely available in tank cars and drums from a plant well located to serve the resin, plastics, surface coatings and chemical industries.

If you can use this versatile chemical, we will welcome the opportunity to send you samples, technical data and price quotations on National Cyclohexanone.



MATERIALS

Many uses seen for diphenyl disulphide . . .

insecticides, fungicides, rubber curing agents seen

Literature indicates that diphenyl disulphide has applications in field of insecticides and fungicides. Treating of conjugated oils with diphenyl disulphide reduces surface defects in films made from them. Compound has also been found effective in vulcanization of rubber and in stabilization of silver halide emulsions.

Compound has formula $(C_6H_5S)_2$, and comes as a white powder assaying 99% minimum purity. MP is 59°C (min). It is insoluble in water; soluble in ether, benzene, and hot alcohol.

(Diphenyl disulphide is a product of Evans Chemetics, Inc., Dept. CP, 250 E. 43rd St., New York 17, N.Y. . . . or for more information check CP 2400 on handy form opposite last page.)

Dihydrocholesterol in limited amounts . . .

acts as antimetabolite for cholesterol

Interest in dihydrocholesterol has been stimulated by investigations that show the compound acts as an antimetabolite for cholesterol. When included in diet of lab animals, it tended to decrease amount of cholesterol in blood and in various other body organs.

(Limited quantity of dihydrocholesterol (3-beta-cholestanol) is available from Special Chemicals Div., Winthrop-Stearns, Inc., Dept. CP, 1450 Broadway, New York 18, N.Y. . . . or check CP 2401 on form opposite last page.)

For more information on product at left, specify CP 2402 . . . see information request blank opposite last page.

National Aniline Division
ALLIED CHEMICAL & DYE CORP.

SHP 15654

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 BOSTON STREET, NEW YORK 4, N.Y.

Boston Providence Philadelphia Chicago San Francisco
Portland, Ore. Greensboro Charlotte Richmond Atlanta
Los Angeles Columbus, Ga. New Orleans Chattanooga Toronto



Speed
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D.C

Speeds up mixing cycle of rubber, yet maintains vulcanizate hardness . . .

makes processing of highly-loaded stocks easy

Uses: As activating plasticizers and processing aids for rubber.

Features: The processing aids speed up mixing cycle of the rubber, yet maintain a high level of hardness and stiffness in the vulcanizate. Thus, stocks containing high filler loadings may be handled with comparative ease. Dispersion of pigments and other ingredients is facilitated by use of the aids, and the cure is mildly activated.

Description: Called Poly-Sperse AP-300 and AP-400, agents are pourable liquids with sp gr of 1.05 and 1.03 respectively. AP-300 is more efficient as a plasticizer and imparts higher hardness and stiffness to cured stock. AP-400 is somewhat lower in cost, although with fundamentally the same action.

In highly loaded stocks, up to 20 parts on the rubber hydrocarbon may be used effectively. Some downward adjustment in accelerator content may be desirable.

(Rubber processing aids are products of National Polychemicals, Inc., Dept. CP, Eames St., Wilmington, Mass. Check CP 2403 opp. last page.)

Stress relaxation techniques to evaluate fibers covered

Stress relaxation techniques to evaluate the physical and molecular structures of natural and synthetic fibers are described in 233-page report. Included are stress relaxation behavior of nylon, Dynel, Dacron, textile rayon, and ramie in distilled water, hydrochloric acid, and, in some instances, in sodium hydroxide, sodium fluoride, lithium chloride, and other reagents.

A discussion of how contribution to stress support of intra- and intermolecular bonds may be separated, and related to internal structure of fibrous materials, by treating extended fibers with reagents of varying concentrations under a variety of temperatures is given. Various methods of interpreting stress-relaxation behavior of textile rayon are considered in addition to interpretations based on the existence of an order-disorder distribution.

To obtain report PB 111655, "Stress Relaxation of Fibers as a Means of Interpreting Physical and Chemical Structure", July 1954, remit \$6.00 direct to Office of Technical Services, US Department of Commerce, Washington 25, D.C.

THE NITROPARAFFINS

New Stars

to give new direction
to the chemical industry

1-NP
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$

2-NP
 $\text{CH}_3\text{CHNO}_2\text{CH}_3$

PHYSICAL PROPERTIES

	NM (Nitromethane) CH_3NO_2	NE (Nitroethane) $\text{CH}_3\text{CH}_2\text{NO}_2$	1-NP (1-Nitropropane) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$	2-NP (2-Nitropropane) $\text{CH}_3\text{CHNO}_2\text{CH}_3$
Molecular Weight	61.04	75.07	89.09	89.09
Boiling Point at 760mm, °C	101.2	114.0	131.6	120.3
Azeotrope with Water, bp, °C	83.6	87.1	91.2	88.4
NP in azeotrope, % by weight	77.1	73.6	64.5	73.1
Vapor Pressure at 20°C, mm	27.8	15.6	7.5	12.9
Evaporation Rate, by volume*	139.0	121.0	88.0	110.0
Freezing Point, °C	-29.0	-90.0	-108.0	-93.0
Specific Gravity at 20/20°C	1.139	1.052	1.003	0.992
Density of Vapors (air = 1.00)	2.11	2.58	3.06	3.06
Weight per U.S. Gallon at 68°F, lb	9.48	8.75	8.35	8.24
Coefficient of Expansion, per °F	0.00064	0.00062	0.00056	0.00058
Refractive Index, n_D at 20°C	1.3818	1.3916	1.4015	1.3941
Surface Tension at 20°C, dynes/cm	37.0	31.3	30.0	30.0
Heat of Vaporization at 30°C, cal./g	143.3	124.8	107.3	104.4
Heat Capacity at 25°C, cal/g	0.422 ^{30°C}	0.441	0.471	—
Dielectric Constant at 30°C	35.76	28.00	23.22	25.48
Ignition Temperature, °F	785.0	778.0	789.0	802.0
Flash Point, °F (Tag Open Cup)	112.0	106.0	120.0	103.0
pH 0.01M Aqueous Solution at 25°C	6.4	6.0	6.0	6.2
Solubility in Water at 20°C, % by volume	9.5	4.5	1.4	1.7
Solubility of Water in NP at 20°C, % by volume	2.2	0.9	0.5	0.6

*N-Butyl Acetate = 100

NP DERIVATIVES ALSO AVAILABLE

AB (2-Amino-1-butanol)	NMP (2-Nitro-2-methyl-1-propanol)
AEPD (2-Amino-2-ethyl-1, 3-propanediol)	ALKATERGES
AMPD (2-Amino-2-methyl-1, 3-propanediol)	TRIS AMINO (Tris [hydroxymethyl] aminomethane)
AMP (2-Amino-2-methyl-1-propanol)	TRIS NITRO (Tris [hydroxymethyl] nitromethane)
NB (2-Nitro-1-butanol)	HAS (Hydroxylammonium Acid Sulfate)
NEPD (2-Nitro-2-ethyl-1, 3-propanediol)	HC (Hydroxylammonium Chloride)
NMPD (2-Nitro-2-methyl-1, 3-propanediol)	HS (Hydroxylammonium Sulfate)

SAMPLES ON REQUEST

Here are the Nitroparaffins — NM (Nitromethane), NE (Nitroethane), 1-NP (1-Nitropropane) and 2-NP (2-Nitropropane). These four NP's have a potential range of usefulness unequalled by any other group of organic chemicals! CSC's new Nitroparaffin plant at Sterlington, La. is now in full production. Additional facilities for increased volume of NP derivatives are nearing completion.

In many cases, they provide better and more economical methods of manufacturing well-known and widely used industrial chemicals. However, the majority of the reactions yield entirely new compounds. There is practically an unlimited number of products which can be prepared from the NP's. As solvents, they present an unusual combination of properties — they are medium-boiling, mild-odored and, most important of all, they have strong solvent power for a wide variety of substances, including many coating materials, waxes, resins, gums, dyes, fats and oils, and numerous organic chemicals. The CSC Nitroparaffins are chemistry's newest stars. They give new direction to the production of old products and the development of new.



COMMERCIAL SOLVENTS

260 MADISON AVENUE

CORPORATION

NEW YORK, N. Y.

INDUSTRIAL
CHEMICALS

When inquiring check CP 2404 opposite last page

NEW OLEYL ALCOHOLS

Higher Purity
Greater Color
Stability
Whiter
Less Odor

Chemifats
that put **SELL**
into your
products



Hydrogenated and Distilled Fatty Acids and Stearic Acid... Hydrogenated Vegetable, Fish, Sperm Oil and Tallow... Hydrogenated Castor Oil... Stearyl, Cetyl, Oleyl Alcohol... Sperm Oils and Spermaceti... Behenic Acid... Erucic Acid... Hydroxystearic Acid.

Other ADM Products:

Linseed Oil, Soybean Oil, Fish Oil, Paint Vehicles, Vinyl Plasticizers, Foundry Binders, Industrial Cereals, Vegetable Proteins, Wheat Flour, Dehydrated Alfalfa Meal, Livestock and Poultry Feeds.

Now, ADM offers the most complete line of oleyl alcohols available anywhere. New fatty alcohols that combine the highest purity of oleyl with a minimum of poly unsaturation. Percentage of oleyl ranges up to 87%.

These new ADOLS put sell into cosmetics, textile chemicals and countless other products. Uses include emulsion stabilizers, emollients, germicides, esters, lubricating oil additives, detergents, chemical intermediates, organic synthesis, defoamers, shampoos, anti-static agents, softeners, penetrants, and others.

ADM doesn't consume any of its Chemifats; the entire output is for sale to industry—in tank-car and LCL quantities. Write for samples of oleyls and other fatty alcohols from ADM's new Ashtabula, Ohio plant.

Archer-Daniels-Midland company

CHEMICAL PRODUCTS DIVISION
2191 WEST 110th STREET • CLEVELAND 2, OHIO

When inquiring check CP 2405 opposite last page

MATERIALS

**Compound used for making O-rings
resists shrinking, swelling
in many fluids...**

formulation based on polymer suitable for service from -20 to +350°F

Recently developed synthetic compound permits production of O-rings that resist swelling or shrinking in many normally destructive organic fluids. Material shows little change in properties after immersion in diester fluids for periods in excess of one month at temperatures of 350°F. Compound shows unusual dimensional stability in high temperature hydraulic fluids, most types of petroleum-base fuels and lubricating oils, organic phosphates, and many halogenated fluids and solvents.

Basic polymer from which compound is made is dihydro perfluoro butyl acrylate, called poly FBA. This chemical is formulated into material suitable for temperatures ranging from -20 to +350°F or higher. Material's flexing characteristics and suitability for fabric impregnation make it ideal for use in diaphragms. Seals made of compound have been dynamically cycled for over 50,000 cycles without failure in hydraulic fluids at temperatures as high as 500°F with over 3000 psi pressure.

Material has produced excellent results in a variety of field applications where hard-to-seal fluids are encountered. Top performance under such tough service conditions as sealing hot paint in a recent installation is one example of the use of the product.

(WJ-70 compound is product of Linear Incorporated, Dept. CP, State Road & Levick St., Philadelphia 35, Pa. . . or for more information check CP 2406 on form opposite last page.)

(Poly FBA chemical from which compound is made is product of Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul, Minn. . . or for more information reader may simply check CP 2406A on form which is located opposite last page.)

**Aldehyde, peroxide formation
inhibited by preservative
in anhydrous ether**

A preservative, sodium diethyldithiocarbamate, is now present in manufacturer's Ether Anhydrous AR in 0.05 ppm concentrations to inhibit formation of aldehyde and peroxide. Working hazards are thereby reduced, and high quality of the ether is protected.

(Stabilized anhydrous ether is a product of Malinkrodt Chemical Works, Dept. CP, 2nd & Malinkrodt Sts., St. Louis 7, Mo. . . or for more information check CP 2407 on form which is located opposite last page.)

THE IMPORTANCE OF PIGMENT PARTICLE SIZE

Color, tinting strength, hiding power, oil absorption, dispersibility, ease of grinding, suspension, freedom from abrasion, reactivity—these and other essential properties of pigments and extenders are directly related to pigment particle size.

In Williams' synthetic pigments—Kroma Reds; Pure red, yellow, black and brown iron oxides; chromium oxides; and Albacar calcium carbonates—particle size is carefully controlled at time of manufacture. Oversize is eliminated. Each of these types is available in a broad range of particle sizes.

In natural pigments, Williams produces specially sized materials, including VVF red oxides, metallic browns, siennas, umbers, and Sparmite (super fine Barytes). Here again, oversize is eliminated.

Below are the ranges of particle size distribution covering Pure Red Iron Oxides and Barytes. Other pigment groups have similar distribution ranges.

Always use Williams' particle-size controlled colors and extenders—and be sure of uniformity in the properties essential to the proper pigmentation of your product.

% BY WT. BELOW INDICATES SIZE

Micron Diameter	Pure Red Oxide		Barytes	
	Light	Dark	Sparmite	No. 1 Barytes
40	100	100	100	99.8
30	100	100	100	99.0
20	100	100	100	88.5
15	100	100	100	73.0
10	99.9	99.3	97.5	57.0
7.5	99.2	98.3	87.0	47.5
5	98.2	84.9	66.5	36.0
4	97.7	74.5	55.0	30.0
3	97.2	25.2	43.0	24.0
2	96.2	7.3	29.5	17.5
1	90.6	5.6	15.0	10.5
0.5	78.0	4.9	7.0	5.0

WILLIAMS
COLORS & PIGMENTS

Easton, Pa. • E. St. Louis, Ill.
Emeryville, Calif.

When inquiring check CP 2408 opposite last page

CHEMICAL PROCESSING

**Combines the advantages
of nonionic detergents
and anionic soaps . . .**

surface-active agent is ethylene oxide condensate containing groups of anionic nature

Uses: As a surface-active agent for cotton, wool, and synthetics in mill operations such as kier boiling, desizing, in bleaching and scouring, and to raise crease and abrasion resistance of resin-finished goods.

Features: Agent has good wetting ability: it works fast and reduces surface tension of water to a minimum. Fully effective over a wide range of pH values, it is stable to caustic soda and sulfuric acid solutions in a range from zero to 10%. It is also stable to calcium and offers no chance for insoluble lime soap formation.

It is an excellent soil suspending agent and has easy rinsing qualities. There is no loss of efficiency from room temperature to full boil.

Description: Surface-active agent is an ethylene oxide condensate containing groups of anionic nature, and thus can combine the advantages of anionic soaps and nonionic detergents without their disadvantages. In nature, therefore, it is crypto-anionic — meaning, that while some anionic groups are present in the molecule, its outward properties and reactions are nonionic.

Compound is very easily dissolved in warm water. Clear, stable solutions are obtained up to 40% concentration, making stock solutions feasible. Not only is it stable in storage, but it is virtually non-corrosive.

(Sandopan DTC is a development of Sandoz Chemical Works, Inc., Dept. CP, 61-63 Van Dam St., New York 13, N.Y. . . . or for more information check CP 2409 on form which is located opposite last page.)

**Sintered metallic oxides
for high temp ceramics**

Series of sintered metallic oxides called Alite and based on aluminum oxide, are described in eight-page brochure. Background, physical properties, high-temp properties, chemical resistance, and applications in processing of these oxides are included. A number of charts and tables are given. Bulletin will be of interest to those investigating the usefulness of high-temp ceramics in mechanical, chemical, and electrical applications.

Bul A-7 is issued by Alite Div., The U.S. Stoneware Co., Dept. CP, 5300 Tallmadge Ave., Akron 8, Ohio. When inquiring about manufacturer's product reader may simply check CP 2410 on form which is located opposite last page.

from a kernel of corn through chemistry . . .

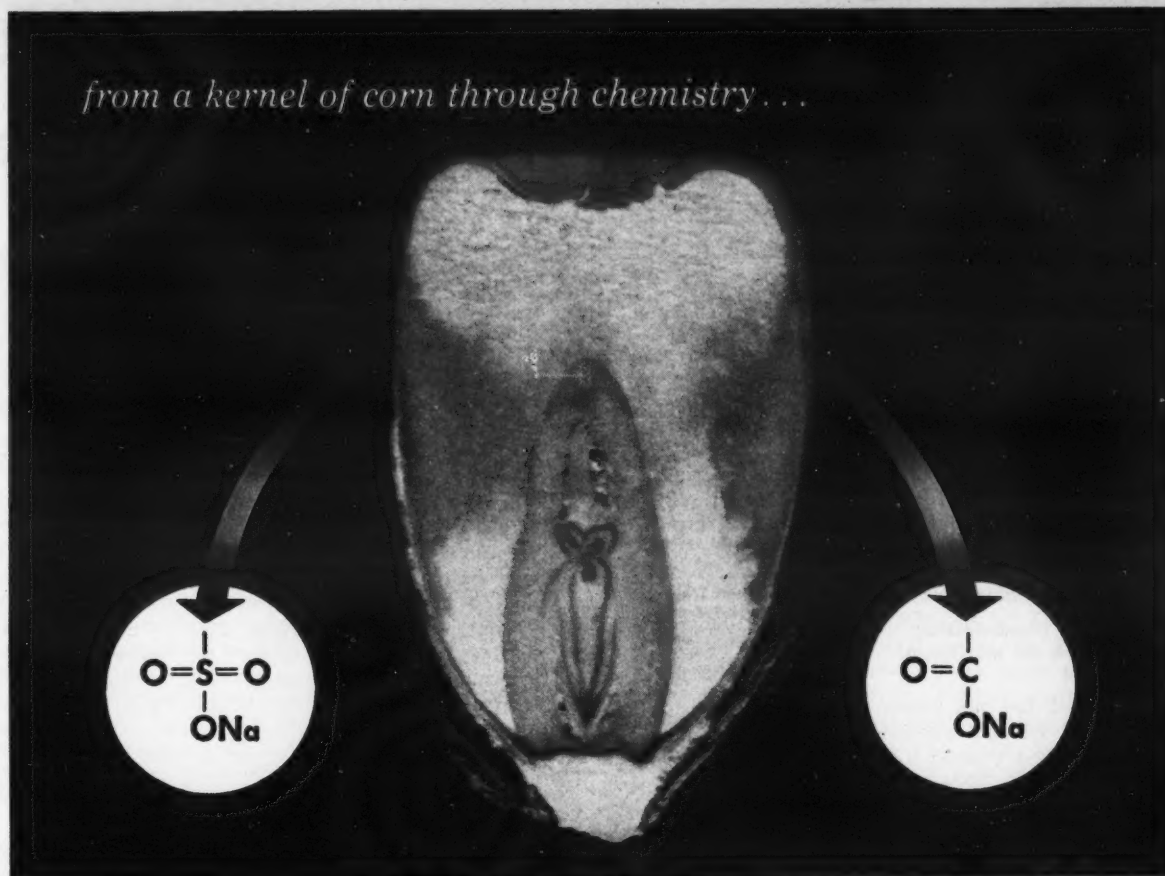


Photo courtesy of Corn Industries Research Foundation, Inc.

a **STARCH** polyelectrolyte

This unusual starch is National's NU-FILM. Some of its original hydroxyl groups have been replaced with carboxyl and sulfonic groups, as sodium salts. The result is a balanced combination of all three groups—and these unique properties:

- lower gelatinization temperatures
- increased hydrating capacity
- greater resistance to retrogradation
- good compatibility with polyvinyl alcohol and gelatin
- improved rinsability
- higher soil and grease repellancy
- better freeze-thaw stability

It suggests these industrial uses:

- suspending agent
- stabilizer
- thickener
- sizing agent
- stiffener
- finishing agent

Would you like to know more about National's NU-FILM? Tell us about the use you have in mind. Our staff of starch technologists will be happy to work with you.

National
STARCH PRODUCTS INC.

270 Madison Avenue, New York 16 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

When inquiring check CP 2411 opposite last page

MATERIALS

Organic chemical outstanding for heat and light stabilization . . .

material acts as effective scavenger for HCl

Uses: As a heat stabilizer for all sorts of calendered and extruded stocks.

Features: Product is especially effective for its synergistic action in conjunction with manufacturer's metallic stabilizers to attain clarity and outstanding heat and light stabilization.

Description: Organic, non-metallic, viscous liquid is an excellent stabilizer. It acts as an effective scavenger for HCl and, as such, is a powerful auxiliary stabilizer for vinyls, chlorinated paraffin, and chlorinated rubber. Product has following specifications:

Sp gr, 20°C	1.060 — 1.070
Vis, 25°C	850-900 cp
Color (Gardner-Holdt)	2
Pounds per gal (approx)	8.9-9.0
Odor	Slight

Material does not present a fire hazard. Toxicity has not yet been established and due care should be exercised. Product is soluble in most plasticizers and lacquers. Material is particularly effective in presence of zinc stabilizers.

(Advastab XE-82 is product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Ave., New York 16, N. Y. . . or for more information check CP 2412 on form opposite last page.)

Dextrin compatible emulsions of polyvinyl acetate now available . . .

formulations have good borax stability, gloss, and pigment binding power

Uses: Adhesive and coating formulations for boxes, labels, cartons, grease-proof and water-proof coatings.

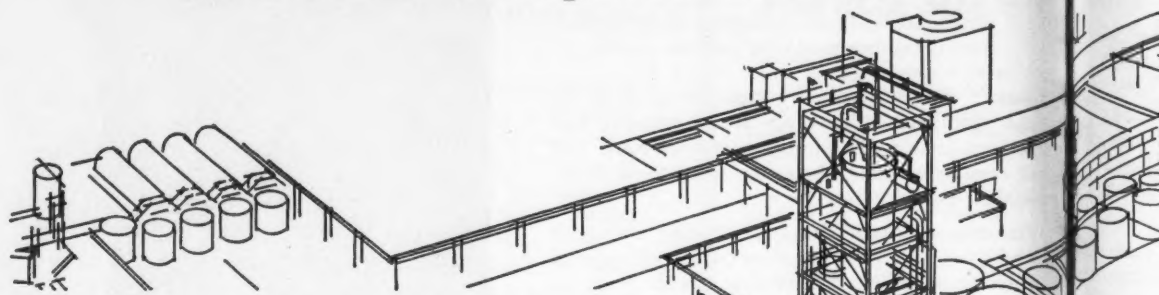
Features: Polyvinyl acetate emulsions have outstanding compatibility with a wide variety of dextrans, permitting more economical adhesive and coating formulations.

Description: Two 55%-solids emulsions are available: NeoVac V19N for adhesion under wet conditions such as grease-proof and water-proof coatings and NeoVac V29N for formulation of remoistenable adhesives used in labels, decals, and similar applications.

(NeoVac V19N and V29N are products of Polyvinyl Chemicals Div., Stahl Finish Co., Dept. CP, 26 Howley St., Peabody, Mass. . . or for more information check CP 2413 on form opposite last page.)

2-SYSTEM FRACTIONATION

the most complete and versatile line



Industry has found a new and valuable tool in Armour's high purity fatty acids. Pure component acids—selected to give you only the specific properties desired—offer short cuts for manufacturers whose products must be high in quality—and pure. In its modern plant at McCook, Illinois, Armour has combined the advantages and flexibility of both fractional distillation and solvent crystallization to achieve tank-car production of Neo-Fat® fatty acids in the highest purities possible—yet at competitive prices. Here you have one basic, economical source for the most complete and versatile line of highest purity fatty acids in the industry. The composition of these Armour Neo-Fats never vary from published specifications. And the standards of quality and purity will meet your most exacting needs. Let Armour Neo-Fats help you obtain greater uniformity in processing, and in your end products, too.



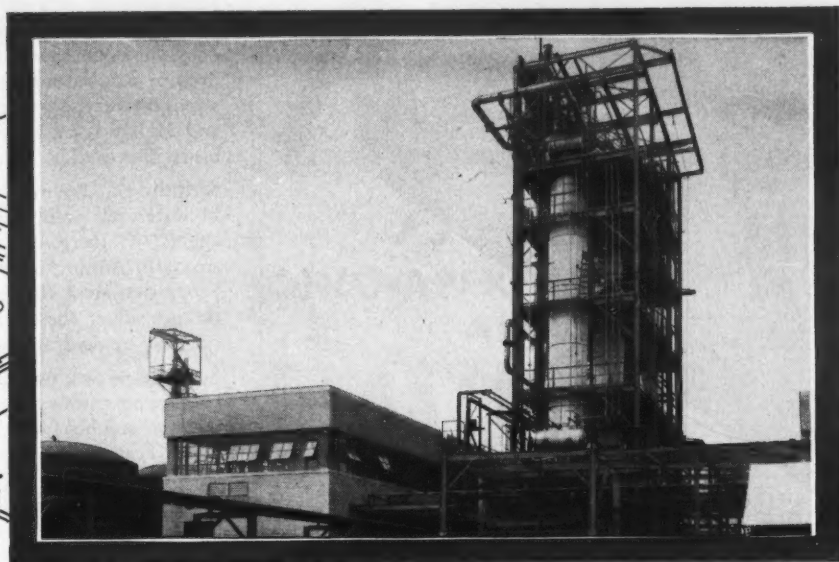
Above, Armour's solvent crystallization process. This part of Armour's 2-system fractionation uses a special non-reacting solvent to separate saturated and unsaturated acids. This produces ester-free unsaturated acids of excellent stability with a controlled iodine range. By modifying fatty acids under strict laboratory and engineering control, Armour utilizes its two fractionation processes to bring you the specific Neo-Fat you need—at highest quality, with no premium in price. Send the coupon for more information on these highly efficient, problem-solving chemicals.



**ARMOUR
CHEMICAL
DIVISION**

© Armour and Company, 1355 W. 31st St., Chicago 9, Ill.

ON -an Armour exclusive—produces line of highest purity fatty acids!



Armour's patented fractional distillation system is shown above. A central control mechanism embracing the latest engineering techniques automatically provides the sensitive follow-through for each step in the process to produce fatty acids of highest purity. The range of acids produced by this process, combined with that of our solvent crystallization system, lets you select saturated fatty acids from 8 carbon chain lengths through 18, as well as various unsaturated acids. And you can order either by specification or by composition.

Fill in the coupon below. Our staff will recommend and send you samples of Armour Neo-Fats which give outstanding results in your field. Start putting these versatile chemicals to work as *your* high purity building blocks for better products.



Order Armour Neo-Fat fatty acids in research quantities —or tank-car loads.

MAIL THIS COUPON WITH YOUR LETTERHEAD TODAY!

ARMOUR CHEMICAL DIVISION
1355 West 31st Street, Chicago 9, Illinois
Please send me samples of Armour Neo-Fats which give outstanding results in the fields I am listing below:

Name.....Title.....
Firm.....
Address.....
City.....Zone.....State.....

CP12

When inquiring check CP 2414 opposite last page

MATERIALS

Costly handling problems eliminated by silicone anti-foam agent . . .

low-viscosity emulsion pours readily and disperses instantly

Uses: Product has been designed specifically for use in aqueous foaming systems. It has already proved its effectiveness in chemical processing, synthetic rubber, adhesives, paper, textile, and soap and detergent industries.

Features: Major advantage of anti-foam agent is that it eliminates costly handling problems that have been associated with the use of conventional viscous, paste-type silicone anti-foam agents in manufacturing operations.

Description: Conventional silicone anti-foam agents designed for use in aqueous systems have been supplied as high viscosity emulsion concentrates. These had to be dispersed carefully in additional water to obtain emulsions of maximum effectiveness. Because of their consistency, a high-speed stirrer was required to obtain good dispersion. On the other hand, this product is supplied as a low-viscosity emulsion that pours readily and disperses instantly, even in cold water. It can be added directly to the foaming system or can easily be diluted with water to any desired concentration. Little or no stirring is required.

(Anti-Foam 60 is a product of Silicone Products Dept., General Electric Company, Dept. CP, Waterford, N. Y. . . . or for more information check CP 2415 on form opposite last page.)

Increase bleaching effectiveness, inhibit corrosion and odor in sodium chlorite use . . .

formation of chlorine dioxide gas controlled by bleaching and stripping additive

Uses: As an additive in bleaching processes using sodium chlorite.

Features: Compound increases the bleaching effectiveness of sodium chlorite. By controlling formation of chlorine dioxide gas to rate at which it is used in bleaching, additive reduces odor and corrosion.

Description: Surface tension is reduced in bleaching bath so that more uniform wetting of fabric is possible. Additive stabilizes any pH on the acid side and can be used on cotton, cotton-rayon blends, viscose, acetate, acetate-viscose blends, Dacron, nylon, and Orlon.

(X-Tan-Assist is a product of Tanatex Corp., Dept. CP, Belleville Turnpike, Kearny, N. J. . . . or for more information check CP 2416 on form opposite last page.)



*We like YOU to profit
by our experience!*



If you're a user of white mineral oil or petrolatum in your product or process, we know you'll be able to profit from our experience in the development, the manufacture, and the use of these products. For that has been our business for over half a century.

No matter how you use these products, this experience of ours can be of help to you in two ways:

First, we can serve you by supplying you with the type of white oil or petrolatum exactly suited to your specific needs . . . tailor-making it if necessary.

Second, we shall give you the benefit—in product quality and technical assistance—of more than half a century's experience in producing white oils and petrolatums and helping industry use them more profitably.

Because white oils and petrolatums are specifically our business, we believe we have more to offer you—productwise and servicewise—to help you turn out a better product. Please feel free to call or drop us a line, anytime!

Achieved by
Sonneborn
RESEARCH

L. SONNEBORN SONS, INC., New York 10, N. Y.

SPECIALISTS IN WHITE OILS AND PETROLATUMS FOR OVER HALF A CENTURY.

When inquiring check CP 2417 opposite last page

MATERIALS

Improve physical properties of paper products . . .

three resins impart characteristic properties

Scriptite 50, a water-soluble polyelectrolyte, is recommended as a surface size for paper and paperboard. It is easily applied by conventional methods, and under normal conditions requires no additive. Resin improves wet and dry tensile strengths of the paper, as well as MIT fold tests and Mullen tests. Porosity is decreased and printability improved.

Scriptite 52, another polyelectrolyte, is insoluble in water but soluble in aqueous alkali. A sizing agent, it increases water resistance and wet strength. Adding formaldehyde will increase these properties. Acid conditions and high temperatures do not affect these properties. Broke can be reclaimed by hydrolysis under alkaline conditions.

Scriptite 54 is a partial ester of a long chain resin containing carboxyl groups. It is insoluble in water, and soluble in alkalis and several organic solvents. Features are that it produces high resistance to water wet rub, and bleed. It also imparts high gloss, toughness, good adhesion, and good printability. Suggested uses include that of an adhesive in clay coating, as a topcoat on colored or coated paper, as a pigment binder on base coating, and as a glossy, water-resistant coating for decorative papers such as wallpaper.

(Resins for paper making are products of Dept. SO, Plastics Div., Monsanto Chemical Co., Dept. CP, Springfield, Mass. . . . or for more information check CP 2418 on form which is located opposite last page.)

Up to four times stronger — that's record of silicone insulating varnish . . .

impregnates, bonds Class B and H electrical equipment — cured at 150°C

Uses: Varnish is used for impregnating and bonding electrical equipment for Class B and Class H service.

Features: On Class B equipment, it permits such improvements in performance as additional thermal protection when applied atop motor and transformer coils. It allows continuous operation of this equipment at hottest spot temperature of at least 25 to 30°C above normal limits for Class B insulating materials.

Tests on coils impregnated with varnish show it to be up to four times stronger at operating temperature than conventional silicone varnishes. Resin maintains superior room-temperature physical properties when tested at high temperatures.

Descript
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at 150°C
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Description: Physical properties of silicone resin varnish have been greatly improved. Resin cures at 150°C as rapidly as conventional silicone varnishes cure at 250°C. Its low viscosity provides good penetration into electrical equipment and shows much less weight loss than conventional varnishes when tested at 250°C.

(SR-60 silicone resin varnish is a product of Silicone Products Dept., General Electric Co., Dept. CP, Waterford, N.Y. . . . or for more information check CP 2419 on form opposite last page.)

Ultra violet absorber family receives two member increase

Superior weathering characteristics and lighter color characterize two additions to the ultraviolet light absorber family.

Uvinul M-40, a cream colored powder, has high solubility in organic solvents. It is specifically recommended for stabilization of chlorine-containing polymers against degradation by UV light. Absorber shows superior heat stability when incorporated in resins and plastics. Color of 2% solution in methyl ethyl ketone is two on the varnish color scale.

Uvinul D-49, a light yellow to tan powder, is somewhat more colored but more efficient on a per-pound basis. It is recommended where maximum degree of protection and permanence is desired for resinous and plastic films, coatings, fibers, sheets, and molded articles where complete absence of color is not required. Absorber has high solubility in solvents, such as toluene, and good heat stability when incorporated in plastics, paints, varnishes and lacquers. Compound is suggested for protection from fading of dyestuffs and pigments in polymeric materials. Color of 2% solution in methyl ethyl ketone is six to seven on the varnish color scale.

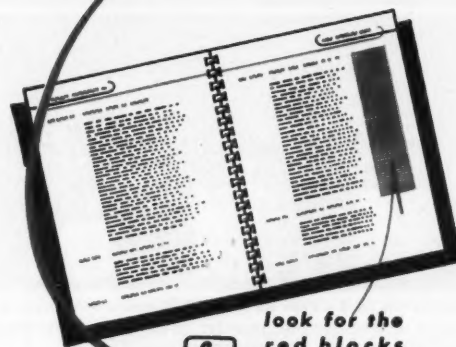
Typical Physical Properties	Uvinul M-40	Uvinul D-49
Melting Point (°C)	62-64	132-136
Solubility (gm/100gm of solvent at room temp)		
Water	0.0009	0.0007
Ethanol	6	0.06
Toluene	52	4.5
MEK	60	7.7
Ethyl acetate	38	5.2
Stoddard solvent	5	0.3

Protection to cast polyester sheets is as follows: Lighter compound at 0.25%, increased time of first color change of sheet when exposed in Fade-Ometer from less than 24 hr to 120-500 hr; the colored compound increased time to 700-1500 hr at some concentration.

(Uvinul M-40, D-49 are products of Antara Chemicals Div. of General Aniline and Film Corp., Dept. CP, 435 Hudson St., New York 14, N.Y. . . . or check CP 2420 on form opposite last page.)

announcing the **NEW** 72 Page OHIO-APEX DIVISION ALL PLASTICIZER CATALOG

CONTAINS THE LATEST
AND MOST COMPLETE
PLASTISOL
DATA AVAILABLE!



look for the
red blocks



OHIO-APEX DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
NITRO, WEST VIRGINIA

"a plasticizer for every purpose"

Send now for this new, multi-colored, 72-page technical catalog which contains complete data on all the Ohio-Apex plasticizers. Two pages are devoted to each primary plasticizer, "thumb tabbed" with the name of the plasticizer which provides a quick and convenient means of locating the information on any plasticizer.

On the double page allotted each plasticizer will be found complete data regarding its properties in both hot processing applications and plastisols. The plastisol data includes all the important properties required to select the proper plasticizer to meet many requirements.

Twenty-one easy to read comparative tables list the plasticizers according to their relative ability to impart a number of important properties. There are also two pages of resin compatibility tables and the plasticizers recommended for several important end properties.

Anyone wishing to receive the Ohio-Apex Plasticizer Catalog may do so without obligation. Simply fill in the attached coupon and send it to . . .

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FOOD MACHINERY AND CHEMICAL CORPORATION
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NITRO, WEST VIRGINIA
I would like to receive your new Plasticizer Catalog.

Name _____
Company _____
Address _____
City _____ State _____

When inquiring check CP 2421 opposite last page

Herbicide formulations

Data are presented on formulations of herbicides that are specifically effective against the narrow-leaf species, particularly annual grasses. Two carbamate chemicals are described: IPC (isopropyl N-phenylcarbamate) and CIPC (isopropyl N-(3-chlorophenyl)-carbamate).

"Herbicides" is issued by Fairfield Chemical Div., Food Machinery & Chemical Corp., Dept. CP, 420 Lexington Ave., New York, N.Y. When inquiring check CP 2422 on form opposite last page.

Selection of properties possible with trio of cationics . . .

surface-active agents should find many uses

Uses: Surface-active agents should prove useful as auxiliary emulsification agents, antifoam agents, dispersing agents, spreading agents, pigment-grinding assistants, acid acceptors, and in numerous other applications.

Features: Products are weakly alkaline, cationic, oil-soluble surface-actives, varying somewhat in respect to other characteristics, such as solidification point, surface activity, and solubility.

Description: Called Alkaterge-A, -E, and -T, they are available in experimental quantities. Chemically, they are substituted oxazolines. Following properties were determined on material produced in the pilot plant and some variation may be anticipated until spec limits are adopted.

	Alka- terge -A	Alka- terge -E	Alka- terge -T
Color (Gardner, 1933)	7	7	7
Solidification point (°C)	-41	-50	59
Sp gr (25°/25°C)	0.883	0.924	—
Refractive index (n_D^{25})	1.4631	1.4738	—
Viscosity (centistokes @ 100°F)	14.5	62	—
Interfacial tension against water (dynes/cm, 0.1% soln in mineral oil)	24.6	18.1	1.8
Surface tension (sat. aq. soln, dynes/cm)	37.6	37.8	30.4
Flash point (COC, °F)	325	395 (none)	—
Solubility in water (ml/100 ml)	0.005	0.4	<0.01

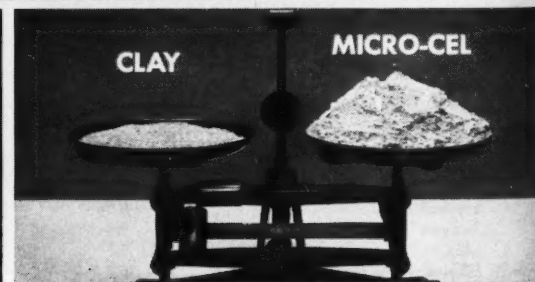
Products are slightly alkaline in nature and it is recommended that frequently-repeated or prolonged exposure of the skin be avoided. However no cases of skin irritation or sensitization have been reported from any of these materials.

Since these materials are amine-type compounds,

Announcing... a new line of synthetic



Absorbs up to 6 times its weight in water—Micro-Cel remains a free-flowing powder even after absorbing more than twice its own weight of liquid.



High bulk . . . loose weight density as low as 5 lb. per cu. ft.—Micro-Cel "fluffs up" any compound with a minimum addition.



Johns-Manville MICRO

calcium silicates developed by Johns-Manville Research MICRO-CEL...

Check its different combination of properties... it may hold the key to lower costs and product improvements in your process formulations.

Johns-Manville's new Micro-Cel line can produce many desirable effects as the following examples illustrate.

Absorption of Liquids—Micro-Cel will absorb 1 to 2½ times its weight of liquids and still remain a free-flowing powder.

Uniform Dry Dispersion—Different Micro-Cel grades with particle sizes as low as .02 microns and particles of rounded to spherical shape provide fast, uniform blending without segregation.

Viscosity Control—Various degrees of viscosity up to a paste or semi-solid can be achieved by adding relatively small quantities of Micro-Cel.

Anti-caking Agent—Micro-Cel's high absorption and fine particle size of less than 0.1 micron effectively control caking of deliquescent products and insure flowability even after prolonged storage.

Bulking Agent—A small percentage of Micro-Cel materially increases the bulk of dry powders—allows control of package density.

Pigment Extender—Micro-Cel's surface characteristics, fine particle size and large specific surface, combined with inertness, indicate its value as a pigment extender.

Suspension Agent—Micro-Cel's different combination of properties provides aid in suspension of heavier solids.

Flatting Agent—Micro-Cel's high absorption, fineness and particle shape indicate its value as a flatting agent.

Reinforcing Pigment—The combination of fine particle size, particle shape, and wetting characteristics suggests the value of Micro-Cel as a reinforcing pigment.

Some Proven Uses

Micro-Cel has already been proven as offering outstanding advantages as an absorbent-grinding aid for high liquid concentrate insecticide wettable powders, as an

anti-caking agent in fertilizers, insecticide dusts, cleansers and detergents. Additional uses are being explored in Johns-Manville's Research Center.

Chemical Composition

Developed after years of research and experimentation by Johns-Manville, Micro-Cel is produced by the chemical combination of lime and diatomaceous silica under carefully controlled conditions. As a result, specific grades are available offering a wide range of physical properties.

RANGE OF PHYSICAL PROPERTIES

Color	white or off-white
*Absorption, % by weight	
Water	300-600
Oil	275-500
Bulk density, lb./cu. ft.	5-15
Ultimate particle size, micron	.02 to .07
pH	8.0-10.0
Moisture (free), wt., %	5-8
Refractive index	1.52-1.55
Available surface area, sq.m./gm.	95-175

*Will absorb 1 to 2½ times its weight in liquid and remain a free-flowing powder.

Samples Now Available

Micro-Cel is now available for laboratory and production evaluation. Write to Johns-Manville for further data on your specific problems. An engineer from J-M's Celite division will be glad to work with you in adapting Micro-Cel to your own particular requirements. Mail coupon today.

Johns-Manville, Box 60, New York 16, N. Y. CP-12
In Canada: Port Credit, Ontario

☐ Please send additional data and samples of Micro-Cel. I am interested in formulating the following products:

☐ Please have local representative contact me

Name _____

Position _____

Company _____

Address _____

City _____ Zone _____ State _____

-CEL SYNTHETIC CALCIUM
SILICATE

A PRODUCT OF THE CELITE DIVISION

When inquiring check CP 2423 opposite last page

MATERIALS

contact with copper and brass should be avoided in order to prevent mild corrosion of the metal and discoloration of product.

(Cationic surface-active agents are products of Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N.Y. . . . or for more information check CP 2424 opposite last page.)

Ten organic chemicals

4-Aminopyridine, $C_5H_6N_2$, mp 154-155°C, reduces to 4-aminopiperidine, piperidine, and ammonia. It reacts with CS_2 to give 4-pyridylthiocarbamic acid. A variety of salts and double salts can be formed.

Azuric acid, $C_4H_5N_5O_3$, mp 245°C, gives the mur-oxide reaction on oxidation with chlorine water.

9-Bromophenanthrene, $C_{14}H_9Br$, mp 65-66°C and bp 360°C, can be oxidized and reduced. With Cl_2 and UV light, 9,10-dichlorophenanthrene and 2,9,10-trichlorophenanthrene are obtained. It may be nitrated in the 10 position. It forms a chemiluminescent hydroxy derivative.

Cetylbenzene, $C_{22}H_{38}$, mp 27° and bp (@ 15mm) 230°C, is very soluble in ether, CS_2 , benzene, and ligroin. It is insoluble in cold water.

dl-Chlorosuccinic acid, $C_4H_5O_4Cl$, mp 151-152°C, can be esterified with alcohol and HCl. It forms many salts. The active chlorine group makes it useful in many syntheses.

2,4-Dimethylthiazole, C_5H_7NS , bp (@ 719mm) 144-145.5°C, is miscible with cold water in all proportions and is very hygroscopic. Its warmed alcoholic solution gives ethylamine and propanethiol when treated with sodium. Some of its derivatives are an H_8Cl_2 double salt (mp 176-177°C), a picrate (mp 137-138°C), and a methyl iodide (dec. 260°C).

Ethyl pyruvate, $C_5H_8O_3$, bp 155°C, undergoes many transesterification reactions. With guanidine, it gives N,N'-dipyrrolylguanidine. A phenylhydrazine can also be formed. Compound is very useful in biochemical investigations.

1-Hydroxyanthraquinone, $C_{14}H_8O_3$, mp 191°C, gives alizarin on fusion with KOH and forms quinizarin with $NaNO_2$ and H_2SO_4 in presence of H_3BO_3 . It is reduced to 1-hydroxyanthrone. Complex metal salts can be formed with Sn, Co, Cu, Ni. Hydroxy group may be etherified with some difficulty: the methyl ether melts at 169.5°C. It forms many glucosides, among them d-araboside (mp 203-204.5°C). Derivatives are useful in analytical chemistry and biochemical research.

(Organic chemicals are products of Bios Laboratories, Inc., Dept. CP, 17 W. 60th St., New York 23, N.Y. Check CP 2425 opposite last page.)



Prevents soap scum ... Cures it too

Where precipitates of calcium and magnesium salts are a problem, Glyco's ethylenediamine tetraacetic acid (EDTA) and salts act both to *prevent* all curd, scum and haze formation, and to *dissolve* it if already present. The effectiveness of Glyco's EDTA as a sequestering and chelating agent has been *proved* in years of use by the textile, soap and detergent, cosmetic and other industries.

Glyco's EDTA and salts — the TETRINE®S — are the purest forms available commercially, from a new plant specially designed to make these products. Plant — products — personnel — all are geared to elimination of your contaminant troubles. Send for samples and our catalog *The TETRINE®S*.

the TETRINE®S
Glyco's EDTA



GLYCO PRODUCTS CO., INC.

Empire State Building, New York 17, N. Y.

NONIONIC SURFACTANTS • SYNTHETIC WAXES • EMULSIFYING AGENTS

When inquiring check CP 2432 opposite last page

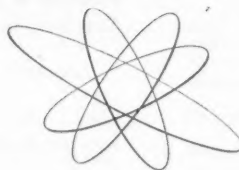
ideas — from other industries and nuclear field . . .
new trends in research, processes, services



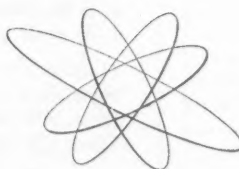
Operator here increases pile's operating level — as he moves the lever on control console, control rods in core model begin to rise

**Authentic feel and standard instrumentation
are built into simulator which . . .**

trains reactor operators with no atomic pile



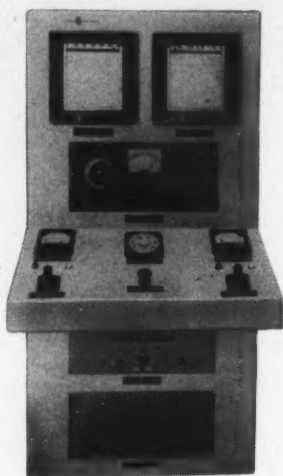
**Produced by builders of the Geneva
swimming pool reactor, simulator can
be operated like a swimming pool,
graphite-natural uranium, heavy water,
or thermal reactor — and no
radioactives are used**



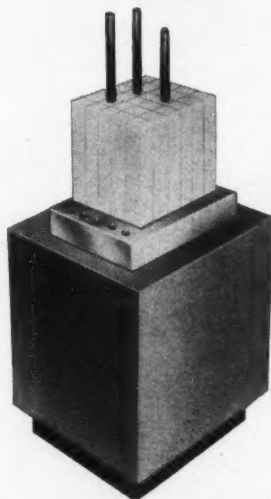
SINCE nuclear reactors are too expensive and too scarce to be used in operator training programs, a shortage of nuclear operators has developed. Cost of the Geneva reactor — roughly a third of a million dollars — is one reason why companies and educational institutions have not put more of these piles to work in training operators. Now, however, a simulated atomic pile has been built which is authentic enough in operation and "feel" to train operators. No radioactive materials are used in this simulator. Cost of the simulator is under \$20,000.

Officially called a "Nuclear Reactor Simulator Assembly", this device provides a scale model of the reactor core, a full-size control panel complete with instrumentation and controls. Model of the reactor is made of plastic. It is of the swimming-pool type, similar to the one exhibited at Geneva. Though only two feet high, it has the same appearance. Control rods can be operated in a model lattice. These are visible to the operator — an

CHEMICAL PROCESSING



Actual simulator is less elaborate than demonstration model pictured in other photo — analog computer is mounted at center of panel, model of reactor core is shown below

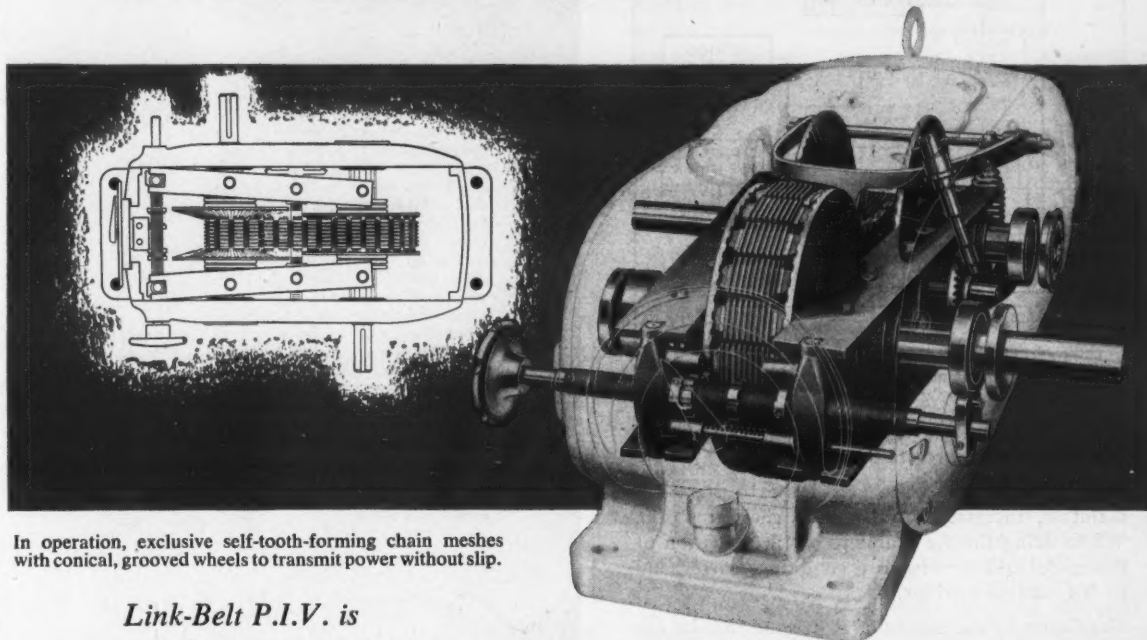


advantage over some atomic reactors where control room is remote from the pile itself.

As control rods are operated, conditions which would arise in the pile are simulated by an analog computer. This simulation is complete to the blue glow of the Cerenkov effect. Recording instruments on the panel, amplifiers, meters, switches and other usual gear are used by operator-trainees to run this simulator. Instead of actually controlling an atomic pile, these are connected to the analog computer which continuously solves differ-

(Continued on next page)

Looking for the accurate mechanical variable speed drive? IT'S LINK-BELT P.I.V.



In operation, exclusive self-tooth-forming chain meshes with conical, grooved wheels to transmit power without slip.

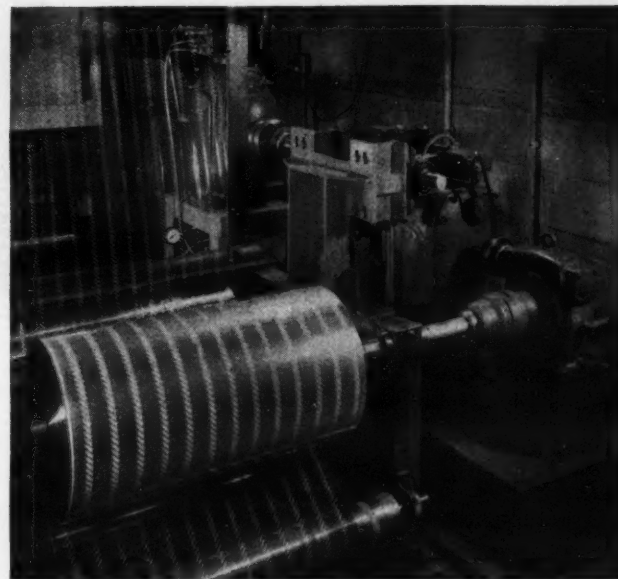
Link-Belt P.I.V. is

- independent of friction
- all metal
- fully enclosed
- automatically lubricated

Here is the Positive, Infinitely Variable speed drive that's not dependent on friction for transmitting power. Instead, its exclusive drive chain with self-forming metal teeth engage with radial grooves in two pairs of cone-shaped wheels. Positive power transmission is assured at all speeds regardless of load.

Movement of the single control screw simultaneously varies effective diameters of wheels on input and output shafts. This makes possible an infinite number of stepless speed adjustments within the range of the drive. Speed of the output shaft can be changed instantly, even while operating under full load.

Link-Belt P.I.V. drives are available in capacities from ½ to 25 hp . . . in 8 sizes and 16 types for horizontal and vertical mounting. See your nearest Link-Belt office or authorized stock-carrying distributor, and write for Book 2274.



On two-color rotogravure press, Link-Belt P.I.V. Variable Speed Drives prevent the build-up of destructive tension in the printing of delicate plastic films and metal foils by controlling the speed of the dryer rolls and press rolls.

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,939-A

When inquiring check CP 2433 opposite last page

REACTOR SIMULATOR

(Continued from preceding page)

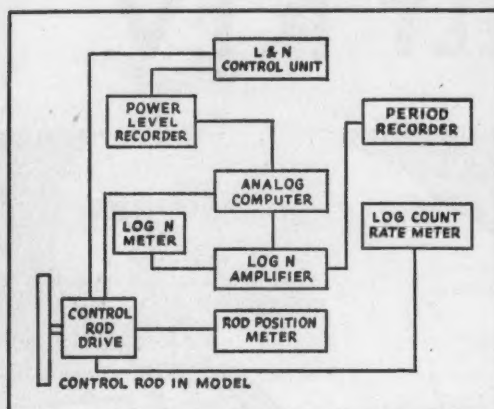


Diagram of nuclear reactor simulator unit

ential equations representing the kinetic operation of a nuclear reactor.

Using simulator, trainee can learn to start up, maintain, increase, and stop the chain reaction. While doing this he is able to watch operation of the model and see what real conditions correspond to his control settings.

Simulation by the computer is so good that he can watch delayed neutron effects "on the way down" and integrating effects "on the way up." Simulator can also be used to test reactor instrumentation.

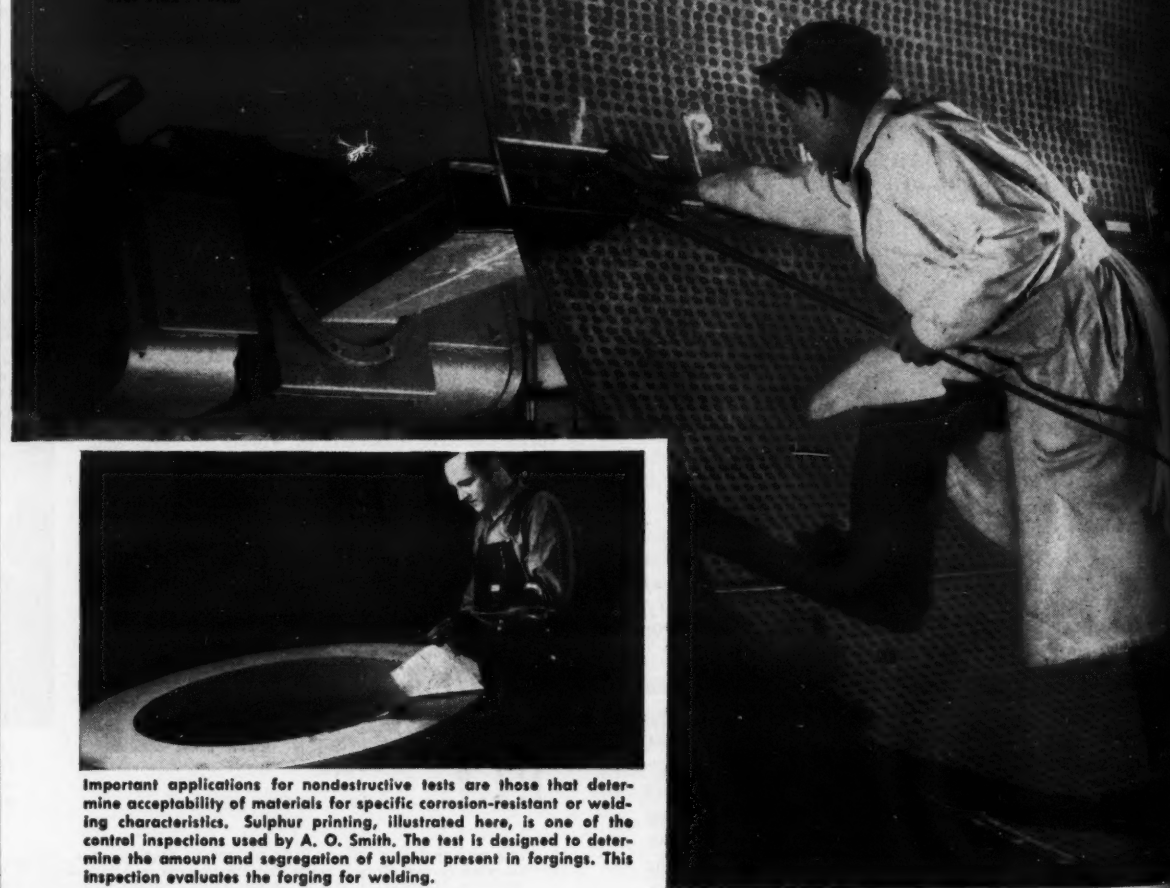
Simulator Itself

Consisting of two basic units (a plastic scalemodel of reactor core approximately two feet high and a full-size control panel complete with instruments and control) simulator does not occupy much space. Two electronic recorders mounted on panel show power level (from 0 to 120% rated power) and reactor's period (ranging from -30 to infinity to +3 seconds). Control panel also houses electronic analog computer, servo amplifier, logarithmic amplifier, power supply, related switches.

In starting up a reactor, trainee stands at the console and uses the same controls he would if he were actually handling a reactor. As rods of the reactor begin rising on scale model, rod position meter shows movement and Log N meter shows counts per second. At the same time, recorders are producing records of pile period and linear flux.

When trainee has brought reactor model to desired power level, automatic control takes over. Failure to judge various factors correctly, which might lead reactor to go beyond safe limits, automatically causes simulator to "scram" the pile — just as safety arrangements on a normal reactor would do. "Scram" emergency button on console

A. O. Smith reports



Important applications for nondestructive tests are those that determine acceptability of materials for specific corrosion-resistant or welding characteristics. Sulphur printing, illustrated here, is one of the control inspections used by A. O. Smith. The test is designed to determine the amount and segregation of sulphur present in forgings. This inspection evaluates the forging for welding.

rts

Nondestructive testing



Still another method of flaw detection used by A. O. Smith is the magnetic particle test. Magnetic particle tests are ideal for detecting surface and sub-surface faults in ferrous materials. In this picture, technicians are shown inspecting the welds on a pressure vessel.



Ultrasonic testing (inspection utilizing high-speed sound waves) is another method A. O. Smith uses for quality control of heavy sections. The picture shows an additional application of ultrasonic testing — operator is determining wall thickness of 167,000-lb. vessel.

Nondestructive inspection is one more reason for the dependability of A. O. Smith vessels, exchangers and other process equipment.



The man in charge of A. O. Smith's nondestructive testing...

A. O. Smith has been in the nondestructive testing business for more than 27 years. Mr. Smith has specialized in nondestructive testing since 1922. He has been a leading force in the development of many of the techniques and procedures now used throughout industry. He is past-president of the National Society for Nondestructive Testing... is serving on nondestructive testing committees of ASME and ASTM and in various other control groups. This experience is another reason why it's wise to call A. O. Smith for your processing equipment.

Illustrated here are just a few of the nondestructive testing processes by which A. O. Smith maintains the quality of its products. Of course, there are many other tests, too — both nondestructive and destructive — all designed to help create equipment that will excel in your operations.

A. O. Smith was one of the members of the original committee that first established radiographic inspection techniques and standards. Also, we have used magnetic particle testing since 1934... ultrasonic testing procedures since 1945.

Through research  ... a better way

A.O. Smith

C O R P O R A T I O N

PROCESS EQUIPMENT DIVISION
HEAT EXCHANGERS • PRESSURE VESSELS

Milwaukee 1, Wisconsin

International Division: Milwaukee 1, Wisconsin

is available for the same purpose.

Simulator is based on studies originally carried out by AEC. Its builders have provided instrumentation for a number of reactors, including the Geneva swimming-pool unit.

Control cubicle is 66" high, occupies 30 x 28" of floor space. Forward sloping shelf projects 12". Unit has wheels at rear so that it can be moved from place to place. Model of reactor core is a 2-ft cube and is mounted on a pedestal 32" high.

(Reactor simulator was designed and built by Leeds & Northrup Co., Dept. CP, 4901 Stenton Ave., Philadelphia 44, Pa. . . or for more information check CP 2435 on form opposite last page.)

Second prototype of homogeneous nuclear reactor to be finished during early 1956

The second prototype homogeneous nuclear reactor for the US is expected to be completed early in 1956. Larger than its predecessor, the unit is designed to produce 10,000 kw of heat and is in nearly all respects a prototype of a full-scale nuclear power plant. Since future plans call for building nuclear plants in or near centers of population, important function of the new reactor is to demonstrate its complete safety.

The reactor and its associated equipment are contained in a sealed steel box, 60-ft long, 30-ft wide, and 25-ft deep. Any leakage of radioactive material will be confined to this container. When equipment must be repaired or replaced, the container will be filled with water and hatches opened at appropriate spots in the top of the box. Workers will manipulate special tools through openings to make the necessary alterations under water. Water will protect men from radiation and also permit them to see what they are doing.

The reactor itself consists of a 6-ft diameter pressurized sphere capable of containing 2000 psi. Inside is a pear-shaped vessel of zirconium, which is the reactor core. Solution of uranium fuel in heavy water is pumped through the inner vessel where the nuclear fission reaction heats the solution to 300°C. After leaving the core the solution passes through a boiler where it heats water to produce steam to drive a turbogenerator. Solution returns to core for reheating.

Space between core and pressure vessel will be filled first with heavy water and later with a slurry of thorium oxide and heavy water. Reactions with thorium will produce uranium U-233 which can be separated from the thorium and used as fuel in the core. The reactor will thus be able to generate its own fuel.

(Summary of paper presented at Geneva Conference on Peaceful Uses of Atomic Energy by Dr. S. E. Beall and Dr. J. A. Swartout, Oak Ridge National Laboratory, Dept. CP, Oak Ridge, Tennessee.)

When inquiring check CP 2434 opposite last page

*We've used "KARBATE" equipment for years
and we're still finding places where it pays off!*

Many users of "Karbate" brand impervious graphite process equipment originally installed it where nothing else would work — then went on to extend its use to other, less severe, process-unit locations. A job doesn't have to be a major headache for "Karbate" equipment to pay off. *Wherever* corrosive conditions exist, consider "Karbate" impervious graphite and "National" carbon and graphite. You'll be pleased with the economies they offer.

10 PAY-OFF FEATURES OF "KARBATE" IMPERVIOUS GRAPHITE PROCESS EQUIPMENT:

- Low first cost
- Extended low maintenance
- Corrosion resistance
- Immunity to thermal shock
- No metallic contamination
- High thermal conductivity
- Workability — readily fabricated and serviced in the field
- Sturdy, durable constructions
- Standard stock units
- Complete technical service

**Manufactured only by
NATIONAL CARBON COMPANY**

*The term "Karbate" is a registered trade-mark of
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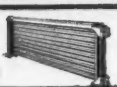
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Catalog Section
S-7250**



**Pipe and Fittings—
Catalog Section
S-7000**



**Heat Exchangers—
Catalog Sections
S-6740 and S-6840**



**Cascade Coolers—
Catalog Section
S-6820**



**HCl Absorbers—
Catalog Section
S-7480**

When inquiring check CP 2436 opposite last page

IDEAS

Nylon paper made commercially

Nylon synthetic paper is being made commercially on a Fourdrinier paper machine exactly as paper made from other types of furnishes. Because the synthetic fiber has properties which differ from ordinary pulps however, there are some differences in the processing before and after the Fourdrinier. These include certain preparation of the fiber before it is run onto the paper machine wire and the addition of a special binder after it leaves the machine.

Finished paper has high tensile strength and good resistance to heat, wrinkles, bacteria, alcohol, ketones, soaps, detergents, moisture, solvents, and other chemicals and gases. It also has good electric properties, high folding endurance, and is reported to surpass many standard papers in the Mullen test for bursting strength. Material can be dissolved by several acids. Porosity can be varied as required.

Cost of product varies with weight. A 30-lb basis weight sells for about 27 cents per sq yd; 40-lb, about 36 cents. Price is expected to drop as production increases.

Although not all uses have been tested, product appears suitable for filters, maps, tracing paper, records, electrical tape, wallboard tape, packaging, and other applications.

(Nylon synthetic paper is product of Riegel Paper Corporation, Dept. CP, 260 Madison Avenue, New York 16, New York . . . or for more information check CP 2437 on form opposite last page.)

GE dedicates \$5 million metals and ceramics laboratory . . .

part of firm's \$13 million expansion program for Schenectady research facilities

As part of its \$13 million expansion program for its research facilities, General Electric has recently dedicated a \$5 million metals and ceramics building at Schenectady, New York. Described as the world's most complete metals and ceramics processing laboratory, building measures 312 by 160 ft and has more than 75,000 sq ft of floor space. Objectives of the laboratory will be:

- 1) To ascertain and analyze areas of most critical need for materials and processes.
- 2) Develop new processes for new business.
- 3) Develop new materials to improve products.
- 4) Study existing materials and obtain better understanding of their properties and processing.

5) Operate pilot plants and obtain economic data.

To maintain maximum opportunity for scientific interchange, ceramics facilities in the building have been closely integrated with those of metallurgy. An extensive area for ceramics formulation, heat treatment, and testing adjoins a similar metal-treating area. Although the company is not primarily a producer of metals or ceramics, virtually all of its products include these materials, and technical progress has depended on the performance of them.

(Information courtesy of General Electric Company, Dept. CP, One River Road, Schenectady, New York.)

Nuclear research program planned by Socony Mobil . . .

aimed at investigation of new energy sources, improvement of petroleum products

A comprehensive program of nuclear research, aimed at investigation of new energy sources and improvement of petroleum refining and petroleum products, has been undertaken by Socony Mobil Oil Company, Inc. The program encompasses:

1) Participation in a joint effort by eight American business enterprises in construction of the first nuclear reactor to be owned and operated by private industry for research in industrial and humanitarian fields.

2) Establishment of a nuclear research center wholly owned and operated by the company. In addition to "hot" laboratories and a "counting" laboratory, the center will include a Van de Graaff accelerator and associated facilities providing high-energy electrons, protons, X-rays, and neutrons for research in nuclear physics and radiation chemistry.

Construction of both facilities — reactor and nuclear research center — is expected to begin this year. Plans call for start of operations within a year.

(Information courtesy Socony Mobil Oil Company, Inc., Dept. CP, 26 Broadway, New York 4, N. Y.)

Supplement deals with refinery air-pollution surveys

Supplement No. 2 to Volume II of the American Petroleum Institute manual on disposal of refinery wastes is now available. The new supplement deals with air-pollution surveys. Literature is available without charge to all holders of the fourth edition of Volume II.

Supplement No. 2 to Volume II on "Waste Gases and Particulate Matter" is issued by American Petroleum Institute, Dept. CP, 50 W. 50th St., New York 20, N.Y.



DEPENDABLE POWER for CSC's new topping-plant is furnished by two 3000 KVA automatic-extraction Worthington turbine-generators. They operate on steam at 600 psi, with extraction at 250 psi and exhaust at 40 psi.

New Worthington turbine-generators help Commercial Solvents double production

In the fall of 1951, the Commercial Solvents Corporation, manufacturers of ammonia, methanol, and other industrial chemicals, undertook the largest expansion program in the company's history — at its Sterlington, Louisiana, plant.

As part of this twenty-million-dollar expansion, a new topping power plant was built to operate with the older 250 psi, 600°F plant. To generate power in this new plant, Commercial Solvents selected two Worthington automatic-extraction turbine-generator sets.

The new additions to the facilities of Commercial

Solvents doubled previous production — making CSC one of the world's largest producers of methanol, with an annual output of 30 million gallons.

Commercial Solvents, like other leading chemical firms who chose Worthington, can look forward to years of dependable service. Worthington turbine-generators are built to extremely rugged specifications to assure complete satisfaction.

For more information about Worthington turbine-generators, get in touch with your nearest Worthington district office. Or write to Worthington Corporation, Steam Turbine Division, Section T.5.9, Wellsville, N.Y.

T.5.9

WORTHINGTON



STEAM TURBINES

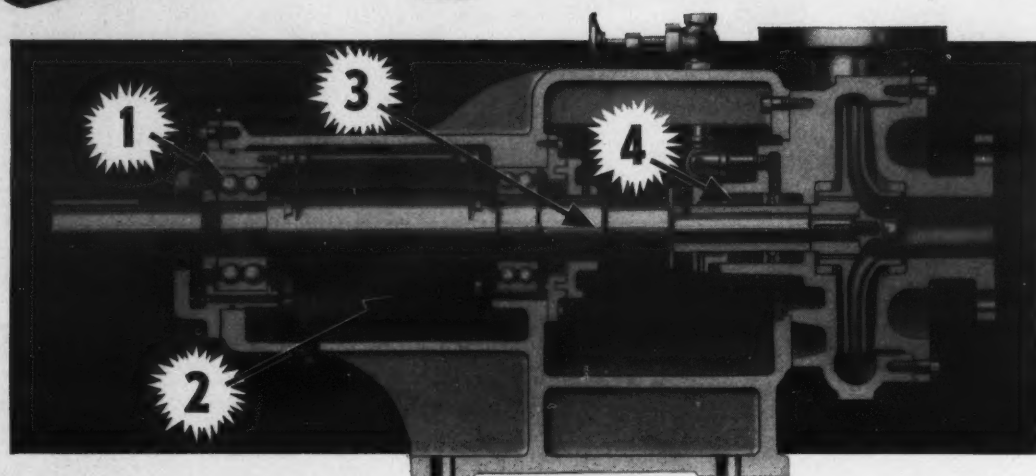
Single- and Multi-Stage Turbines • Turbine-Generators • Deaerators • Boiler Feed Pumps • Surface Condensers

A GREAT TEAM IN STEAM

When inquiring check CP 2438 opposite last page

ALLIS-CHALMERS
Oil-Lubricated
Chemical
PUMP

4 Check these Quality Spots

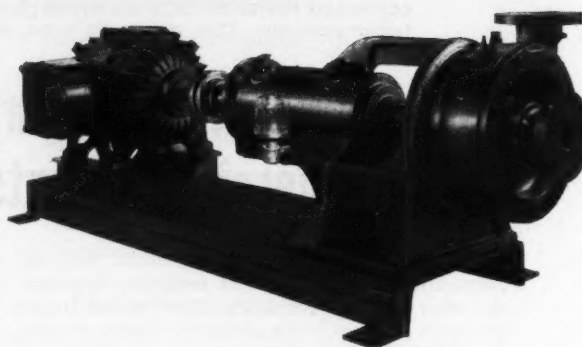


Cut Maintenance Costs and You Cut Pump Costs!

Here's an "all-around" pump designed for your industry. It costs hundreds of dollars less than refinery pumps — yet does many of the same jobs. It costs a little more than grease-lubricated pumps — yet more than makes up the difference by cutting maintenance.

It's a quality pump throughout. As shown above, it has:

1. Double-row oil-lubricated bearings with positive end closures suitable where acid or alkali vapor or abrasive dust is present.
2. Oil lubrication — which does away with the most common cause of bearing failure — overgreasing. Oil lubrication also permits operation at higher temperatures.
3. Heavy shaft — holds alignment, reduces wear of parts. Either high grade carbon steel or stainless steel is provided, depending on application. Pump can be supplied with or without shaft sleeve as desired.



4. Alternate sealing arrangements — Any one of six different sealing arrangements can be provided, including a water-cooled stuffing box where the liquid being pumped is above 250 F.

Allis-Chalmers builds many types of pumps, but this particular type is recommended for pumping liquors, corrosive materials and solutions in the most used ratings to 3500 gpm, heads to 400 feet for liquids to 550 F.

A-4870

For complete information call your nearby A-C office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin, for Bulletin 52B7638.

ALLIS-CHALMERS



When inquiring check CP 2439 opposite last page

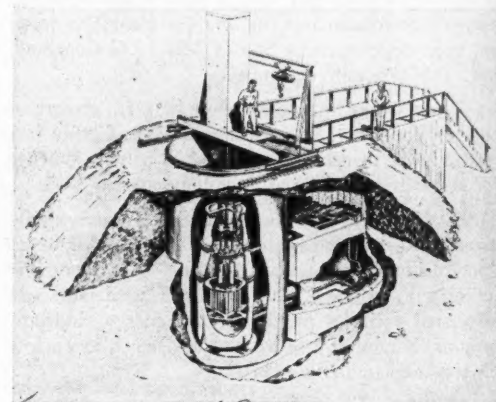
IDEAS

Water-cooled reactor blows up, but tests show that they are safe . . .

conditions needed for explosion would probably never occur in normal use

Tests conducted during a two-year period at the AEC's National Reactor Testing Station in Idaho have shown that a properly designed water-cooled and moderated nuclear reactor, if allowed to get out of control, will automatically shut itself down before excessively high temperatures would cause destruction of the reactor. The series of over 200 tests is regarded as being of great importance to the future development of reactors for the production of electrical power.

Reactor, known as Borax I, consisted of a core assembly of plates made of enriched uranium and aluminum immersed in water inside a steel tank or reactor vessel. The vessel stood inside a larger, open tank, which was partially buried in the ground. Earth was piled around the protruding section of the tank for shielding. Reactor was operated from control station one-half mile away.



Cutaway drawing of reactor used in tests. Reactor core consisted of uranium-aluminum fuel elements and five neutron-absorbing control rods

Experiments simulated hypothetical reactor accidents in which the control rods, which normally hold the reactor power to a safe level, suddenly lose control and allow power to increase at a rapid rate.

The reactor was provided with five neutron-absorbing control rods, one of which could be ejected rapidly downward out of the reactor core under the influence of strong springs and gravity. Reactor was made critical (operating) at a very low power with this rod inserted to some pre-chosen position in the reactor, and with the remaining control rods (known as shim rods) more or less fully withdrawn from the core.

Main rod was suddenly ejected and the reactor power was allowed to rise exponentially. An instant after the rod had been dropped, the inside

of the tank was illuminated by a flash of light which originated in ionization and Cherenkov radiation as the reactor power reached a high value. Heat, liberated by the fissioning of uranium atoms, caused steam to form around the fuel plates and the resultant absence of neutron moderating water immediately reduced the reactor power to a safe, low point.

Further experiments were conducted in which the power was increased tenfold in slightly more than a hundredth of a second. These experiments were mechanically more violent and caused expulsion of steam and water from the reactor tank. Water was thrown out of the tank to a height of about 30 ft, and the pressure in the reactor core arising from the rapid acceleration of water was sufficiently high to deform the fuel plates. Despite this mechanical damage, maximum temperatures reached by the fuel plates (about 640°F) did not approach the melting temperature and power was again reduced to a low level.

Upon completion of the experiments, it was decided that the reactor should be sacrificed in an experiment which would be violent enough to melt the fuel plates. The ejection of the rod required only about 0.2 seconds and the rod was about 80 per cent out of the core when the reactor power reached its peak value. Maximum power was in excess of ten million kilowatts.

Most of the fuel plates melted and the pressure resulting from the molten metal in contact with water burst open the reactor tank. The control rod mechanism was carried away and the remains of the reactor core were ejected high into the air. Most of the fuel element fragments fell within a radius of 200 ft around the reactor, and there was no appreciable radioactive fall-out at distances greater than a few hundred feet.

Although the reactor was destroyed, the explosion was relatively mild — comparable to that produced by a few pounds of TNT. The conditions needed to bring about the explosion were such that there is an almost negligible probability of this happening to an operating reactor.

(Summary of paper presented at Geneva Conference on Peaceful Uses of Atomic Energy by Dr. Joseph R. Dietrich, Argonne National Laboratory, Dept. CP, P. O. Box 229, Lemont, Illinois.)

Tells how to cut costs with castings

How to cut production costs with castings is told in 12-page brochure. Advantages cited include good reproduction detail, reduction of weight, conservation of material.

Bul 205 is issued by Electric Steel Foundry Company, Dept. CP, 2141 N. W. 25th Avenue, Portland, Oregon. Specify CP 2440 opp. last page.

apades in industry

Take pity on Herman (an overworked engineer).

With time at a premium, busy, busy Herman had to devise a method for removing highly corrosive pickling liquor from a tank. Since the tank was constructed with a rubber membrane and a brick lining, it was important that the rubber membrane not be broken for a drain connection.

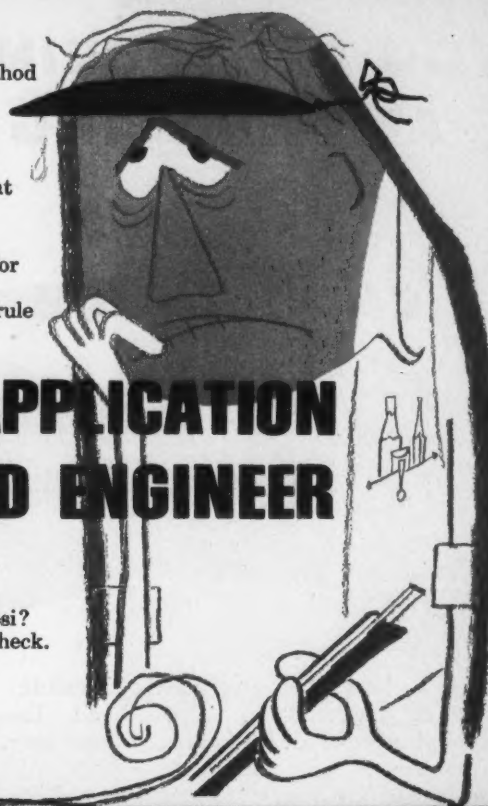
Herman decided a jet was ideal for the job. Herman was right! He took pencil, paper, and slide rule in hand and settled down to

THE CASE OF THE JET APPLICATION AND THE OVERWORKED ENGINEER

work out the problem . . .

Syphon? Eductor? Exhauster, compressor, jet vacuum pump? psi? gpm? Derivation, computation, check.

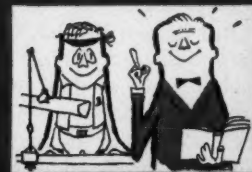
Herman was wrong! And, he knew it—knew there had to be an easier and better way. So this is what he did . . .



Herman decided a jet was ideal for the job. Herman was right! He took pencil, paper, and slide rule in hand and settled down to work out the problem . . .



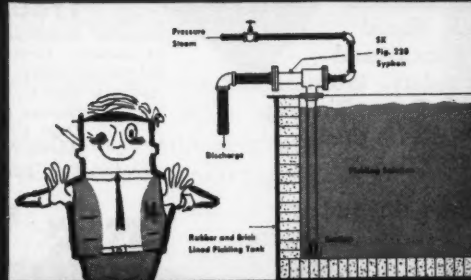
Herman decided a jet was ideal for the job. Herman was right! He took pencil, paper, and slide rule in hand and settled down to work out the problem . . .



Herman decided a jet was ideal for the job. Herman was right! He took pencil, paper, and slide rule in hand and settled down to work out the problem . . .

SOLVED THE PROBLEM EASILY!

The SK Fig. 228 Steam Jet Syphon allows, with its special corrosion resistant materials, to bring acid or caustic liquid from a pickling tank down the tank to a rubber and brick lined siphon tank. The syphon provides the action of a rubber membrane, it is ideal for industrial operations.



Moral! Request a copy of Bulletin J-1 for your files. Make use of a qualified specialist, your nearest SK Sales Engineer.



Schutte and Koerting

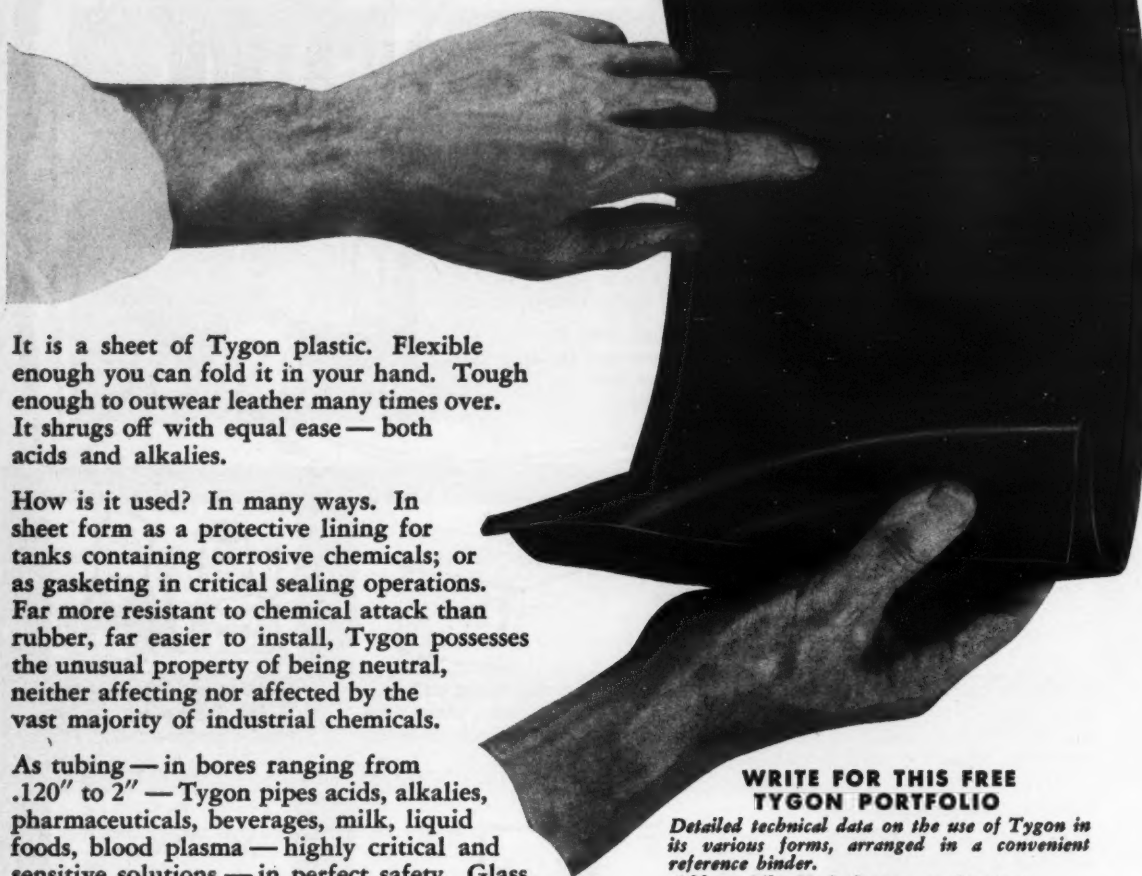
COMPANY
MANUFACTURING ENGINEERS

2215 STATE ROAD, CORNWELLS HEIGHTS, BUCKS COUNTY, PA.

Jet Apparatus • Heat Transfer Equipment
Strainers • Condensers and Vacuum Pumps
Oil Burning Equipment • Rotameters
Flow Indicators • Radiant Tubes • Valves
Spray Nozzles and Atomizers • Gear Pumps
Desuperheaters

When inquiring check CP 2441 opposite last page

YOU ARE LOOKING AT ONE THING *Corrosion* CAN'T TOUCH



It is a sheet of Tygon plastic. Flexible enough you can fold it in your hand. Tough enough to outwear leather many times over. It shrugs off with equal ease — both acids and alkalis.

How is it used? In many ways. In sheet form as a protective lining for tanks containing corrosive chemicals; or as gasketing in critical sealing operations. Far more resistant to chemical attack than rubber, far easier to install, Tygon possesses the unusual property of being neutral, neither affecting nor affected by the vast majority of industrial chemicals.

As tubing — in bores ranging from .120" to 2" — Tygon pipes acids, alkalis, pharmaceuticals, beverages, milk, liquid foods, blood plasma — highly critical and sensitive solutions — in perfect safety. Glass clear, flexible as a piece of string, Tygon Tubing is the standard of research laboratories the world over.

As a liquid Tygon serves both as a paint and as a dip coating. Applied by brush or spray, it protects metals and concrete from attack by acid fumes.

Tygon molds as readily as rubber, and in this form extends its protective qualities over an almost unlimited range of intricate shapes.

If corrosion is a problem to you — Tygon may prove the perfect answer.

376-D

WRITE FOR THIS FREE TYGON PORTFOLIO

Detailed technical data on the use of Tygon in its various forms, arranged in a convenient reference binder.

Address: The U. S. Stoneware Company
Plastics and Synthetics Division
Dept. CP-1255
Akron 9, Ohio

Ask for the TYGON PORTFOLIO.



Plastics and Synthetics Division

When inquiring check CP 2442 opposite last page

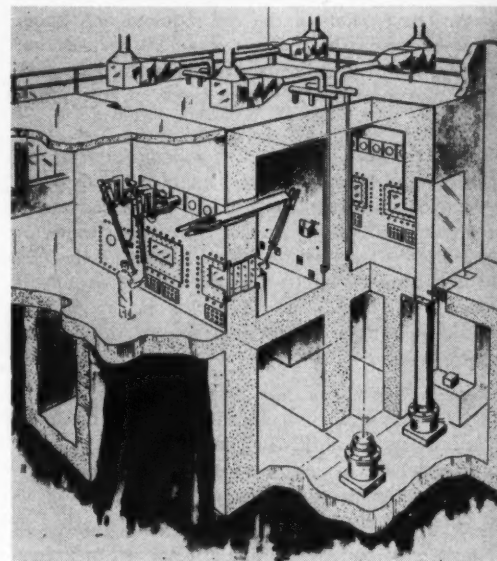
IDEAS

Atomic energy research center begins operations . . .

first unit of Battelle's \$3.5 million project finished

Reported to be the first of its capacity built without Federal funds, the first of three major units in Battelle Institute's new atomic energy research center is in use. Known as the "hot cell" laboratory, it will be used to study effects of radiation on materials used in nuclear reactors and on handling and processing of nuclear fuels and other radioactive materials. Other two units — a power reactor development (critical assembly) laboratory and a swimming-pool-type research reactor — are expected to be completed by early 1956. Total cost of project will be about \$3.5 million.

The hot-cell laboratory has been designed and engineered for the safe handling of large quantities of highly radioactive materials. It consists of two cells having inside dimensions of 18 x 8 x 12'. One is designed to handle up to 10 million curies of radio-



Subterranean chambers are located below hot cells. These are used for storage and for experiments which do not need direct viewing

active material that emits gamma rays having an energy of one million electron volts. Other is designed for gamma radioactivity levels up to 10,000 curies.

Walls of cells are made of high-density concrete, 2 and 3' thick, clad on both sides with 1/2" steel. Windows are of high-density glass, and doors are of solid steel up to 18" thick and weighing up to 20 tons each. Manipulations within cells are done with a variety of remote-handling equipment. Most of equipment is mounted on portable tables to pro-

(Continued on page 63)

Remember the trademarks "tt"
and "TUBE-TURN" are applicable only
to products of TUBE TURNS.

tt
TUBE-TURN
TRADE MARKS

How to get more for your dollar in stainless steel fittings!

When you specify TUBE-TURN* Welding Fittings and Flanges . . . regardless of type, size or material . . . you can be *sure* you are getting *top value*. Manufacturing improvements which we are constantly making assure not only unsurpassed quality, but economies which are passed on to you.

In TUBE-TURN Stainless Steel Welding Fittings, for example:

Recent advancements in our production techniques have netted important savings, resulting in price reductions. Are you taking advantage of these savings . . . plus the extra values described on the next page?

TUBE-TURN Welding Fittings and Flanges are made in U.S.A.
They meet all U.S. piping code specifications.

TUBE TURNS

LOUISVILLE 1,
KENTUCKY

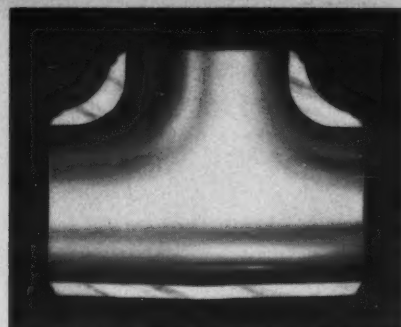
A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Chicago • Kansas City • Denver
Los Angeles • San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas

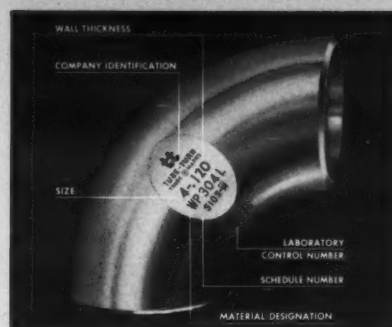


*"TUBE-TURN" and "tt"
Reg. U. S. Pat. Off.

EXTRA VALUES



MATCH PIPE for calculated bursting strength.



LONG-LASTING IDENTIFICATION. Electro-etch markings give complete, permanent information. Fittings have bright, attractive finish.



UNIFORM WALL THICKNESS. Pipe minimum wall thickness tolerance of 87½% of nominal thickness is maintained.

TUBE-TURN* Stainless Steel Welding Fittings and Flanges offer you these extra values



MEET ALL CODES: ASTM A312 (for material); MSS SP43 and ASA B16.9 (for dimensions); MSS SP25 (marking procedure).



COMPLETE LINE IN STOCK . . . four analyses: Type 304, 304L, 347 and 316. Four wall thicknesses: Schedules 5S, 10S, 40S, 80S.

TUBE TURNS, Dept. KK-6
224 East Broadway, Louisville 1, Kentucky
Please send me chart TT 730.

Company Name _____

Company Address _____

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*Available from your nearby
TUBE TURNS' distributor*



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TUBE TURNS

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

LOUISVILLE 1, KENTUCKY

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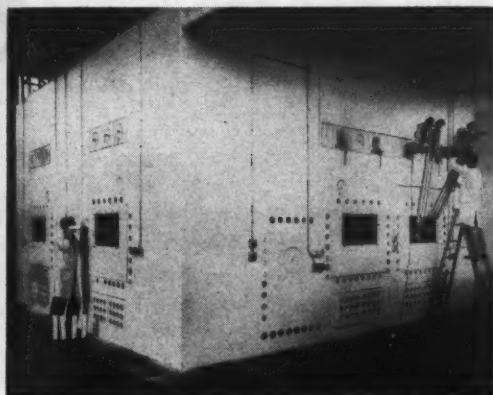
DECEMBER

(Continued from page 62)

vide flexibility in interior arrangement.

Subterranean chambers are located below the cells. Here radioactive solutions can be stored, and operations can be conducted that need no direct viewing or manipulations. Hatches in floors can be opened to make these underground spaces available for operation of tall equipment that cannot be accommodated in the 12' clearance of cells proper.

Associated with cells are decontamination room for



Hot cell has inside dimensions of 18x8x12'. Concrete walls are 2 and 3' thick

cleaning equipment, an underground storage area for solid radioactive materials, and a 14'-deep tank for storage and handling of radioactive materials under water. Building also houses general laboratory areas, machine shop, locker rooms, and offices.

(Information courtesy of Battelle Memorial Institute, Dept. CP, 505 King Avenue, Columbus 1, Ohio.)

Tells role of temperature control in plastic working processes

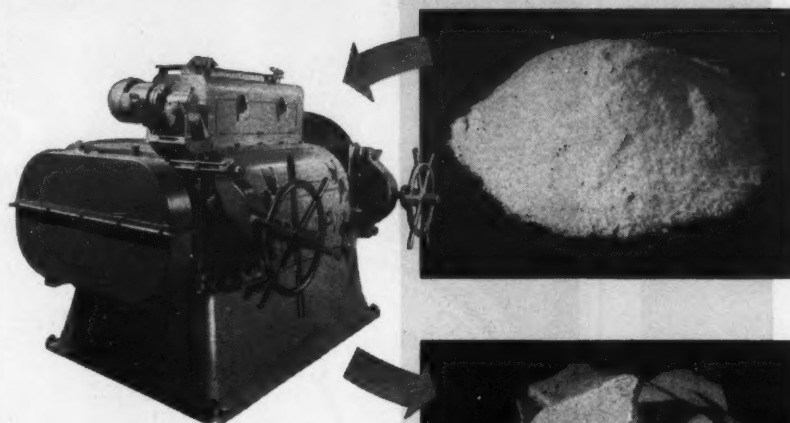
Typical plastic working processes, and their dependence on temperatures, are described in two-page technical reprint. Use of temperature indicating crayons, lacquers, and pellets for determining the recommended temperatures is explained.

Reprint "Molding Temperature Control with Temperature Indicating Crayons" is issued by Tempil Corporation, Dept. CP, 132 West 22nd Street, New York 11, New York. When inquiring specify CP 2443 on form opposite last page.

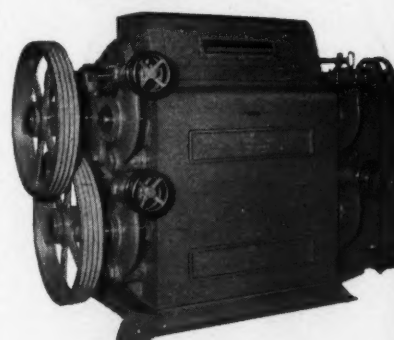
For more information on product at left, specify CP 2444 . . . see information request blank opposite last page.

ALLIS-CHALMERS PROCESS SYSTEM

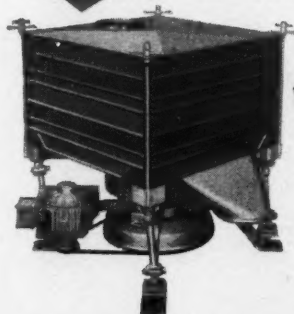
Converts Fine Particles Into Granular Product To Meet Consumer Demand



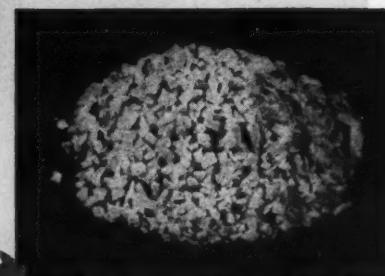
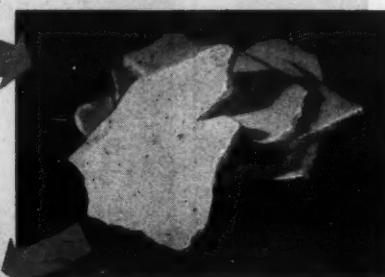
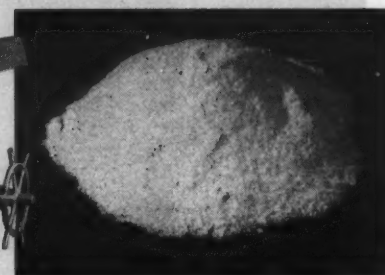
Compacting Mill



Roller Mill



Circle Sifter



1 Recovery operation starts with unacceptable minus 30 mesh chemical salt — fines created in original process.

2 An Allis-Chalmers heavy duty compacting mill is the principal component in the recovery system. The flakes illustrated are the result of mechanical densification in the compacting mill. An Allis-Chalmers two-pair high corrugated roller mill is used to granulate flakes. Final separation is made in the Circle sifter — an Allis-Chalmers gyratory screen. An 80% to 90% recovery of salable product is effected.

3 The resulting granules (100% minus 3 mesh and 100% on 10 mesh) equal or surpass natural product in every respect. Reconstituted product differs little from parent product in abrasion tests. Other tests have proved the compacted granule superior in controlled solubility. Granulated product is more uniform in particle size, flows more freely and has better "eye-appeal."

A-4743

Circle is an Allis-Chalmers trademark.

For complete information, see your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 25C6177J.



ALLIS-CHALMERS

When inquiring check CP 2445 opposite last page

Oil well output boosted 900% by electric heater . . .

melts paraffin barrier, opens way for steady pumping

Oil output from low-producing wells is expected to be boosted some 900 per cent by the use of a recently developed electric heater. The heating device literally melts its way through the paraffin barrier found in most low-producing wells, and opens the way for consistent pumping. The paraffin barrier is the gummy substance formed from the heavy, sludgy crude oil found in many wells.

Manufactured jointly by N. W. Curson Associates of California and the General Electric Company, the 18-ft long heater assembly includes six 80-inch Calrod heater units. Heater is sealed in oil-tight pipes which are enclosed in rigid conduit and lowered into the well shaft. One West Coast well is reported to have increased its production from five to 45 barrels a day by use of the heater.

(Information courtesy of General Electric Company, Dept. CP, One River Road, Schenectady 5, New York.)

Fiber metallurgy may prompt new uses for metals

New metallurgical process, known as "fiber metallurgy", may lead to new uses for metals. Process is similar to powder metallurgy except for the use of short metal fibers as the starting material — a bulk starting form of metal heretofore not used. Products made by the process have a wide range of porosities combined with relatively high strength and toughness. Proposed applications include filter materials and additives to plastics, catalyst masses, ceramics, and friction materials. Aeronautical uses are also anticipated.

Properties of fiber metal bodies can be adjusted by controlling methods of manufacture. For instance, the selection of proper wire diameter and length can be very important in developing the desired properties. Tests conducted to compare tensile and impact strength of fiber and powder metallurgy products have shown that the fiber bodies have some significant advantages over powder products.

Fiber bodies also lend themselves to felting processes similar to Fourdrinier process used in paper making. Felted material can be sintered, coined, or impregnated. It can also be pressed to a higher density, if desired. To improve strength and ductility, a brazing material having a lower melting temperature can be added after suitable heat treatment.

(Fiber metallurgy process is available on a license basis from Armour Research Foundation, Illinois Institute of Technology, Dept. CP, 10 W. 35th St., Chicago 16, Ill. Check CP 2446 opp. last page.)

Tubing and Pipe

High Pressure

Specific major tubing applications necessary for the steel industry. A complete line of products for pressure installation to carry out the thesis of being a water. corrosion sure strength causing.

Selection for Applications

Specific working pressure is one of the major considerations in the choice of tubing or pipe for a given fluid-handling application. To obtain optimum efficiency and economy, however, it is necessary to consider temperature conditions, tube size, mechanical strength of the steel, and corrosion hazards.

A case in point that clearly shows the complexity of selecting the right tubing for pressure applications involved the installation of a stabilized stainless steel to carry methanol and unreacted synthesis gases at 300 F and 5000 psi while being exposed to chloride-bearing bayou water. This exposure caused pitting corrosion which, in turn, localized the pressure stresses at the roots of the pits causing, eventually, failure by stress

corrosion. To effectively solve this costly problem, B&W with its long experience in all phases of tubing applications, helped in selection of B&W Croloy 5. This choice provided increased resistance to the pitting while meeting the temperature and pressure factors satisfactorily *and at a substantial savings in material cost.*

It takes an expert to specify the optimum tubing or pipe for any particular application. And there is no substitute for the kind of experience with such problems that you will find at B&W. To get the most benefit from B&W's long experience in matching tubes and piping to jobs—call on Mr. Tubes, your nearby B&W Tube Representative. Or write for Bulletin 6.

THE BABCOCK & WILCOX COMPANY TUBULAR PRODUCTS DIVISION

Beaver Falls, Pa. and Milwaukee, Wis.: Seamless Tubing,
Welded Stainless Steel Tubing
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

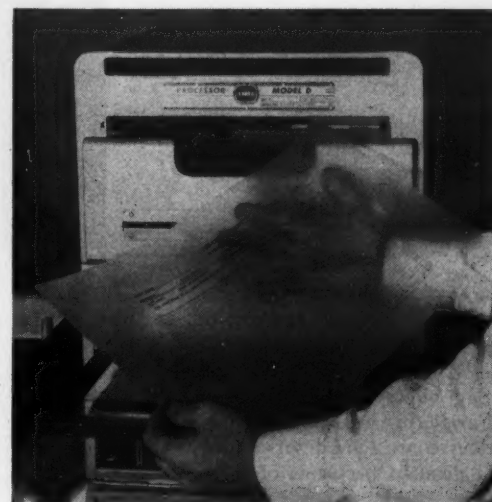


When inquiring check CP 2447 opposite last page

Positive-working metal plates prepared in 10 minutes by xerography

Positive-working metal offset plates can be prepared in about 10 minutes by process involving use of xerography. Since no negative, masking, or opaquing is required, monetary savings of 60 per cent have been reported over conventional methods requiring photographic negatives and dark-rooms.

Key to the new process is an inexpensive 10x15" translucent film (called a Xerox trans-positive sheet) onto which any type of original document may be copied by xerography. Sheet, in effect a positive film, is then transposed on a positive working, pre-sensitized metal plate, and both are exposed to ultra-violet light.



Translucent xerographic copy of original document is used as intermediate in speedy new process for making positive-working metal plates

Light acts upon the sensitized coating in all areas of the plate except those shielded by the opaqueness of the image in the sheet. After exposure, the metal plate is developed and finished with fluids. It is then ready for use on the offset duplicator.

Xerography has been widely used for quite some time. It is a clean, fast, dry, electrostatic way of copying, with photographic accuracy, anything written, printed, typed, or drawn. It is used to prepare paper as well as metal masters for offset duplicators and translucent intermediates for diazo-type machines. Since standard xerography equipment is used in the new method, it extends the use of existing facilities where xerography has already been installed.

(Xerox equipment and supplies are products of The Haloid Company, Dept. CP, 55 Haloid Street, Rochester 3, N.Y. Check CP 2448 opp. last page.)

**"Project Sherwood"
in full swing**

Major research efforts in controlled thermonuclear reactions are being carried on at AEC Laboratories operated by the University of California at Los Alamos, New Mexico, and Livermore, California. In addition, there are projects at Oak Ridge, Tennessee, and New York University.

Over-all program is known as Project Sherwood. It is directed toward possibility of controlling release of the great amounts of energy from reactions involving the fusion of light nuclei.

(Information courtesy of US Atomic Energy Commission, Dept. CP, Oak Ridge, Tenn.)

**Acid regeneration unit
solves refinery acid
disposal problem . . .**

produces 98-99% H_2SO_4
from sludge

Large sludge acid regeneration unit at Baytown, Texas, produces strong, white acid from any spent sulfuric acid, regardless of hydrocarbon content, and solves spent acid disposal problems of oil refineries within shipping distance. Although aimed primarily at serving refineries in Gulf Coast area, some clients thousands of miles distant are reported to have found it advantageous to ship their sludge by barge to the Gulf Coast.

Sludge acid is a by-product in manufacture of aviation gasoline, benzene, lube oil, kerosene, and other refinery products. The Baytown facilities offer a savings in capital investment on part of refineries by eliminating need for burners, hydrolyzers, and concentrators in treatment of heavy sludge acid.

In the regeneration unit the various sludge acids are first blended to produce a charge stock of suitable content for most efficient regeneration. Blended sludges are



Here are three of the rotary vacuum filters. Hoods and flues are Type 304 Stainless Steel.

Stainless Steel hoods and scrubbers expected to last "indefinitely"

**at AMERICAN CYANAMID COMPANY'S
Michigan City, Indiana, plant**

SEE THE UNITED STATES STEEL HOUR. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

then fed to a combustion chamber by a spray burner which atomizes the acid with compressed air.

Sludges are burned and reduced to sulfur dioxide, carbon dioxide, and water vapor. Gases then pass through a dust collector. They are next cooled in a waste heat boiler, scrubbed with weak acid, and the temperature further reduced to about 80°F. Gases are also passed through a mist separator.

Following this, the gases are dried, picked up by main blower and passed through heat exchangers. They then enter a converter where the sulfur dioxide is oxidized in the presence of a catalyst. From the converter the SO_2 gas is cooled and sent to the absorbing tower where it is converted into 98-99 per cent acid.

Company has four units in operation at other locations.

(Acid regeneration unit is operated by Consolidated Chemical Industries, Incorporated, Dept. CP, 380 Madison Avenue, New York 17, New York . . . or for more information check CP 2449 on convenient Reader Service slip which is located on form opposite last page.)

Research in minerals processing field

Research in minerals processing is outlined in 26-page illustrated booklet. Photographs depict the facilities and equipment available at research organization for conducting the work.

"Research in Minerals Processing" is issued by Battelle Memorial Institute, Dept. CP, 505 King Avenue, Columbus 1, Ohio. When inquiring specify CP 2450 on convenient Reader Service slip which is located opposite last page.

For more information on product at left, specify CP 2451 . . . see information request blank opposite last page

The scrubber. Made from Stainless Steel (including the draft fan), it is protected against internal or external corrosion.

THIS plant manufactures silica gel for use as a synthetic cracking catalyst in the petroleum industry.

The rotary vacuum filters are in use 'round the clock, 24 hours a day, 7 days a week. When the equipment was originally installed back in 1951, they decided to use Type 304 Stainless Steel for the hoods because of the highly acid and corrosive nature of the filtrate. The hoods are still in perfect condition; and the feeling is that they will last "indefinitely."

The same goes for the Type 304 Stainless Steel scrubber, used to scrub waste furnace gases before discharging to the atmosphere. The fan is also made from Stainless Steel. The scrubber is out in the open, exposed to the weather, and is in fine condition.

Stainless Steel in these two applications has

eliminated the probability of periodic replacement of costly equipment. Further, it has eliminated the expense of annual painting.

When corrosion plagues you, an application of Stainless Steel will usually give you more return for your money than any other expenditure. And for service-tested quality, specify USS Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

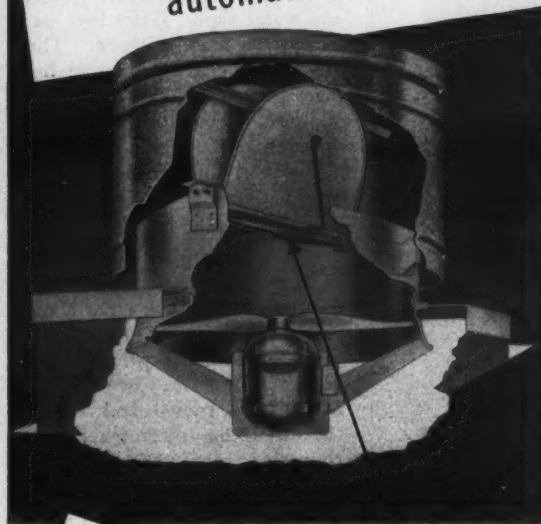
USS STAINLESS STEEL



SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL

SKY-BLAST Roof Ventilator now vents fires automatically!

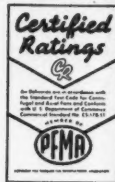


Exclusive
New
Feature

Smoke-Trip*
EMERGENCY
DAMPER OPENER

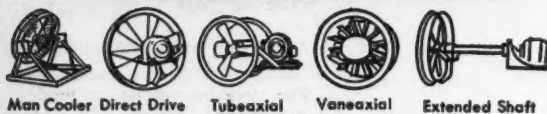
This powerful roof ventilator is now available with an important new safety device... the Smoke-Trip emergency damper opener developed as the result of recent fire studies. Heat from an uncontrolled blaze inside the building will melt a fusible link, releasing high-torsion springs which open the dampers. Treacherous smoke, heat and fumes which hinder fire fighters are vented to the outside air.

Fan operates independently — The Smoke-Trip device does not affect ventilating action of the Sky-Blast in normal use. The high-efficiency airfoil propeller scoops up heat, moisture, dust and fumes and blasts them high in the air. Powered by a dependable Robbins & Myers All-Weather Motor, the Sky-Blast is ruggedly built of zinc-coated steel for long, maintenance-free service. Available in 24 sizes with certified air deliveries from 2820 to 78800 CFM.



Write for Bulletin 685-C

*Patent Pending



When inquiring check CP 2452 opposite last page

safety

Orders from Fire Marshall's headquarters were relayed by AC-operated transmitter



Could your plant direct fire fighting — in a real emergency?

Communications, vital in disaster survival, are frequently among the first casualties of a bad fire. At Whiting, Indiana, Standard Oil proved that foresight pays — mobile radio stations were the backbone of communication when fire knocked out plant telephones

Not quite three hours after the explosion of Standard's new hydroformer, fire ate into the main telephone terminal block, silencing the entire plant system. Thus two-way radio was assigned the entire task of providing communications, not only for actual fire-fighting but for all other operations in the plant area.

Normally, Standard's two-way radio system is used primarily for dispatching material handling and

maintenance equipment and by Plant Protection. The system originally consisted of five control units, connected by telephone lines to a 250-watt base station atop the main administration building, thirty-six mobile units, mounted on the various vehicles and two portable sets.

Use of mobile radio for emergency communications was not a hastily conceived proposition. Standard had long kept in readiness a disaster control center,



Mobile units stationed throughout plant area immediately relayed Fire Marshall's orders, directed fire-fighting operations at the "front"

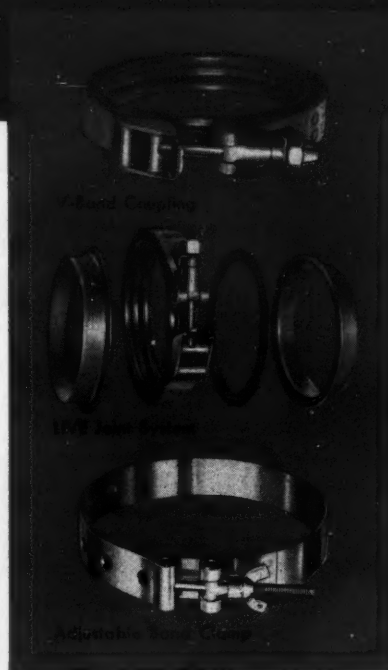
equipped with radio, area maps and stores of fire-fighting supplies. Although the radio system wasn't expected to bear the full weight of communications during an emergency, its part in fire control was mapped out well in advance.

When fire destroyed the telephone system, all five remote control stations were knocked out. During the rest of the emergency all orders were given directly from the Fire Marshall's headquarter by radio. At first, a mobile unit, parked outside, was used. Later, AC-powered sets became available, releasing the mobile unit for field service.

After explosion of the hydroformer, flames quickly spread to nearby tanks which had been punctured by flying fragments of steel. Soon rivers of burning oil were menacing other tanks. Calls for sand went to local suppliers. This was used for building dikes to stem the flow of flaming oil.

To direct sand truck drivers, unfamiliar with the plant layout, mobile units were spotted at key points to act as "traffic cops". Operators reported new out-breaks, requested fire-fighting equipment as needed and generally served as "eyes" for the Fire Marshall.

(Continued on next page)



Marman V-Band Coupling Speeds Filter Change on Processing Equipment

W. M. Sprinkman Corporation of Milwaukee, designers and manufacturers of food processing equipment, recently changed to Marman V-Band Couplings on their entire line of stainless steel fluid filters.

A Sprinkman official reports, "We have found by going to the Marman Couplings that filters are assembled and disassembled much faster. We also find we can hold higher pressures on our filters than was possible using flanges and tie bolts."

If you have a clamping problem on your equipment, let Marman solve it. Write for full information.

MARMAN PRODUCTS COMPANY, INC.

A SUBSIDIARY OF



CORPORATION

11214 EXPOSITION BLVD., LOS ANGELES, CALIFORNIA

MARMAN PRODUCTS ARE MANUFACTURED UNDER VARIOUS U.S. AND FOREIGN PATENTS AND OTHER PATENTS PENDING

When inquiring check CP 2453 opposite last page

Scott Air-Paks

Cut Repair and Maintenance Costs, Safely!

*Right — Old Method.
Blowing air into chemical
storage tank for 24 hours
before man can safely
enter.*

*Below — No Waiting.
No Down Time with Scott
Air-Pak protection. Man
enters and does the job
immediately, safely.*

SAVED 24 HOURS on every Tank Cleaning Job

• Many times an old established practice is accepted as "The way it has always been done". No attempt is made to change it. Blowing air into a chemical storage tank from 12 to 24 hours before permitting a man to enter to clean or paint it, is a typical example! It's a slow and costly method. How much simpler and lower in cost to equip a man with a Scott Air-Pak — open the tank and let him go to work immediately — Safely and Quickly!

Does tank cleaning and painting play a part in your process? Let us tell you more about the Scott Air-Pak Way.

Write for free booklet "Scott Air-Paks Save Money, Man Hours and Men for Industry!"

On
Hazardous Jobs
Scott Air-Paks
Help Management
and Labor
Breathe Easier



SCOTT AVIATION CORP.

242 ERIE STREET

LANCASTER, N. Y.

Canada: Safety Supply Co., Toronto — Branches in principal cities
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, N. Y.



SAFETY

MOBILE RADIO

(Continued from preceding page)

One instance serves to illustrate the function of these mobile operators. Fire broke out in a tank vent in the undamaged Indiana Tank Field. This field, separated from the main section of the refinery by a highway, contains more the 30 storage tanks, and was near an evacuated residential section of Whiting.

Driver of the nearest mobile unit spotted the fire and broke in on traffic dispatching with a high priority request for fire equipment. Within four minutes this blaze had been extinguished and more equipment answering the call was diverted to other duties.

As the magnitude of the fire became apparent, additional radio equipment was ordered from the manufacturer. First units to be delivered — on a Sunday — were three AC-operated sets to replace the dead dispatching points. Later, five portable radiophones and 20 portable "pack" sets were pressed into service.

Examination of the Whiting disaster proves that a reliable, two-way radio system — and a firm, workable disaster plan — undoubtedly prevented more widespread damage and possible complete destruction.

(Mobile radio equipment at Standard's Whiting plant was produced by Motorola, Inc., Dept. CP, 4545 Augusta Blvd., Chicago 51, Ill. . . . or for more information check CP 2455 on form which is located opposite last page.)



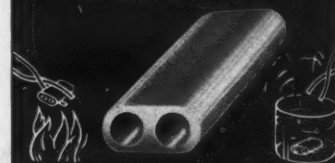
Resistance to wetting

. . . of polyethylene eliminates acid burns and equipment damage caused by acid dripping down sides of lab bottles. Sleeves, first used on wine bottles, are now employed on CP reagent bottles.

(Polyethylene fitments are standard on all five-pint chemical containers from Grasselli Chemicals Dept., E. I. du Pont de Nemours & Company, Dept. CP, Wilmington, Del. . . . or for more information check CP 2456 on form opposite last page.)

Be Certain WITH SERV-RITE

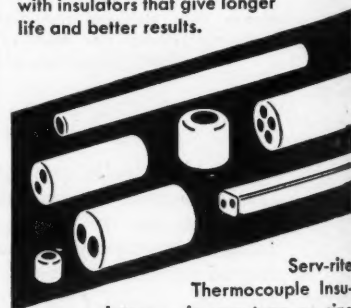
THERMOCOUPLE INSULATORS



This Gordon Thermocouple Insulator, heated red hot and plunged into cold water, came out just as good as new

Available only through GORDON, Serv-rite Thermocouple Insulators are made to stand the gaff of excessive thermal shock far above normal requirements.

For sturdy and reliable thermocouple insulator performance to meet peak production needs—specify Serv-rite . . . a development backed by Gordon's many years' experience in supplying industry with insulators that give longer life and better results.



Serv-rite Thermocouple Insulators — in any type or size — can be supplied immediately from Gordon's large stocks in the Chicago and Cleveland plants. Remember — you can always distinguish Serv-rite insulators by their tan color.

Fish Spine Beads Asbestos String
Asbestos Tubing Single Hole
Double Hole Round Double Hole Oval

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SERVICE**

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Manufacturers & Distributors
Thermocouple Supplies • Industrial Furnaces & Ovens
Pyrometers & Controls • Metallurgical Testing Machines
603 West 30th Street, Chicago 16, Illinois
2031 Hamilton Avenue, Cleveland 14, Ohio

When inquiring check CP 2457
opposite last page

CHEMICAL PROCESSING

When inquiring check CP 2454 opposite last page

Novice fire-fighters aided by simple nozzles . . .

units produce all degrees of fog or straight, non-feathering stream

Uses: No. 711 is designed for use on hose rack and cabinet units. No. 1300 is primarily for use in industrial applications.

Features: Both nozzles supply all degrees of fog plus non-feathering straight stream. Model 711 functions well at low pressures.



Nozzles produce all degrees of fog plus straight stream

Description: Both units can be shut off by turning in either direction, thus reducing waste and water damage. Nozzles are approved by Underwriters Labs.

(Nos. 711 and 1300 nozzles are produced by Akron Brass Mfg. Co., Inc., Dept. CP, Wooster, Ohio. Check CP 2458 opposite last page.)

Light-weight flexible clothing aluminized to reflect heat . . .

serves to provide protection from mild heat

Uses: Protection of personnel working near mild heat sources.

Features: Aluminized clothing is light in weight, flexible, and has good abrasion resistance.

Description: Designed for use where excessive heat and molten metal are not factors, clothing gives protection against mild heat-sources at very low cost. Reflectiveness is about 60% compared with fire-approach or fire-entry suits. Composition is a glass cloth with an aluminized coating.

(Aluminized protective clothing is a product of H. M. Sawyer and Son Co., Dept. CP, 20 Thorndike St., Cambridge 41, Mass. . . or for more information check CP 2459 opposite last page.)

Wagner
ELECTRIC MOTORS
... the choice of leaders
in industry

New NEMA Frames
Standard and Explosion-proof



Type EP
215 Frame

Wagner Totally-Enclosed Fan-Cooled Motors *cut maintenance time and costs*

Check the features of the new *Wagner Type EP Totally Enclosed Motor*. They spell the difference between needless expenditures in maintenance time and costs . . . and a definite savings in motor upkeep and repairs. You'll find that for general industrial use where dust, dirt, filings, abrasives, steel chips or moisture are present, the Wagner Type EP Motor gives steady, troublefree performance and longer service life.

Wagner Type JP Explosion-Proof Motor . . . has the same quality construction as the Type EP — plus added features which make it completely safe to operate where explosive dust, gases or vapors are present.

Both Type EP and JP Wagner motors are available in ratings up to 250 horsepower. For complete information, just call the nearest of our 32 branch offices, or write for Bulletin MU-203.

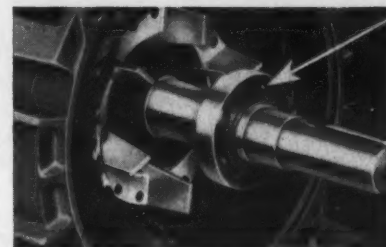
Wagner Electric Corporation
6359 Plymouth Ave., St. Louis 14, Mo.



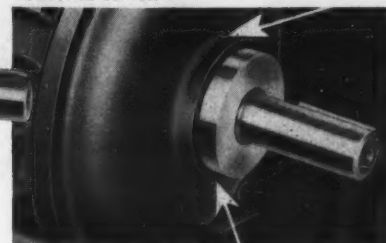
M55-18

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS-AIR AND HYDRAULIC

When inquiring check CP 2460 opposite last page



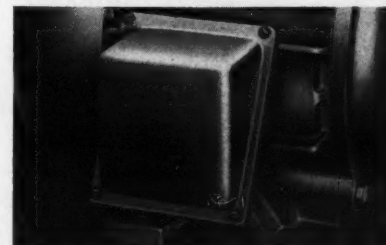
1 HEAVY-DUTY BALL BEARINGS—Highest quality bearings of more than ample capacity provide long, troublefree service.



2 BEARINGS CAN BE RE-LUBRICATED—Wagner motors can be re-lubricated when necessary to prolong bearing life.



3 BEARINGS STAY CLEAN—Both ends of these motors are equipped with running shaft seals, a machined collar mounted on the motor shaft.



4 EASY TO CONNECT—Large diagonally-split conduit box provides ample room for making connections. Leads are permanently identified.

5 NO GREASE LOSS—Bearing housings have effective seals to prevent escape of grease.

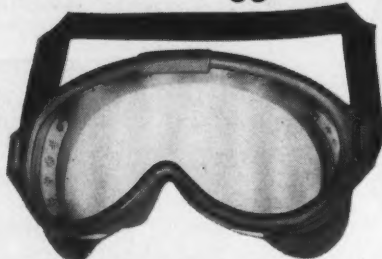
6 RIBBED FRAME—Ribs on the corrosion-resistant cast iron frames add mechanical strength and increase the surface area for more efficient cooling.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

CESCO *RIGHT... before your Eyes!*

NEW Chemical Goggles

No. 100
CESCO



Moulded from black synthetic rubber with wide, soft contact surfaces to provide comfort. Perfectly contoured to fit snugly all around for complete protection. Elastic headband is easy to adjust. Full view, transparent plastic window fits in deep holding grooves. Can be replaced in a few seconds. Baffled ventilator holes on each side prevent fogging. Can be worn over most glasses.

The No. 100 CESCO Chemical Goggles are a must for anyone working in dusty air or near splashing liquids.

No. 99 Approved CESCO Respirator

A twin cartridge organic vapor respirator (BM Approved) with positive acting inhale-exhale check valves which prevent rebreathing. High breathing efficiency. Easy to install new cartridges. Converts to No. 96 (BM Approved) CESCO Dust Respirator by changing cartridges to filter pads. Buy one respirator with cartridges and filters for dual service.



Aprons and Sleeves

CESCO Aprons and Sleeves are made of Acitex, a tough, flexible, lightweight material with high resistance to acids, caustics, and splashing liquids. Withstands abrasion and strain in ordinary use. "Welded" seams eliminate all metals and stitching.

See your CESCO
Safety Equipment Distributor
or write for details

CHICAGO EYE SHIELD COMPANY • 2316 Warren Boulevard, Chicago 12, Illinois



CESCO FOR SAFETY

OFFICES IN: Atlanta, Birmingham, Boston, Buffalo, Cincinnati, Cleveland, Columbus, Dallas, Detroit, East Orange, Houston, Indianapolis, Kansas City, Knoxville, Little Rock, Los Angeles, Louisville, Mexico City D.F., Milwaukee, Montreal, Peoria, Philadelphia, Pittsburgh, Salt Lake City, San Francisco, Spokane, St. Louis, St. Paul, Toledo, Tulsa, Wichita

When inquiring check CP 2461 opposite last page

SAFETY

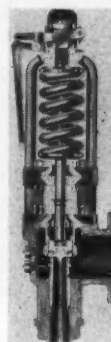
*Design incorporates
temp compensation
for superheat...*

safety valve with high capacity means fewer units

Uses: Over pressure protection for high-pressure, high-capacity steam generating units and related superheaters, reheaters, headers and lines.

Features: For superheater service, cooling spool and spindle having high thermal expansion coefficient are used to provide proportional thermal compensation.

Description: Line of valves is designed for pressures ranging to 3000 psi and temps to 1050° F. Units are available with flanged outlet and either welded or flanged inlet. Sizes range from 2 to 4". Relieving capacity of valve is ASME certified.



(Model HC valve is product of Crosby Steam Gage and Valve Co., Dept. CP, 43 Kendrick St., Wrentham, Mass. . . or for more information check CP 2462 on form which is located opposite last page.)

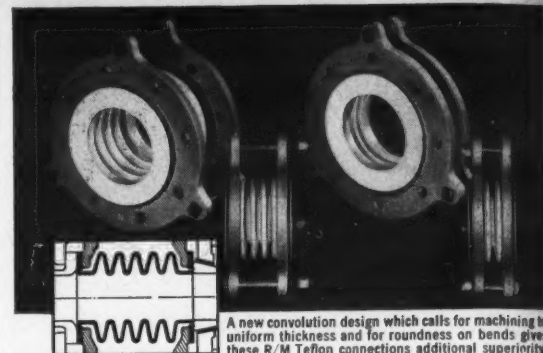
*Provides sure footing
despite uneven
surface...*

support device also saves wear on ladders — lessens stresses

Uses: Provides steady support for ladders on uneven terrain or irregular surfaces, eliminating makeshift leveling devices such as blocks or bricks.

Features: Mechanism locks in place as user puts weight on first rung. Can then be unlocked only by hand.

Description: Device attaches to any wood or metal ladder. Legs adapt themselves to any surface, permitting ladder to stand



A new convolution design which calls for machining to uniform thickness and for roundness on bends gives these R/M Teflon connections additional superiority.

R/M Teflon makes chemically impervious expansion joints and flexible couplings

R/M Teflon Expansion Joints and Flexible Couplings show no reaction against chemicals; are unaffected by any known industrial acids and caustics; have no known solvent; have zero water absorption; and are unaffected by weather. The construction design diagrammed above enables them to absorb greater shock and vibration. A special tie rod arrangement prevents overexpansion of joints and bending of pipes. See your R/M distributor for full details.

*Du Pont's trade-mark for its tetrafluoroethylene resin

R/M PACKINGS
RAYBESTOS-MANHATTAN, INC.
PACKING DIVISION, PASSAIC, N.J.

When inquiring check CP 2463 opposite last page

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HANDY • POCKET SIZE • LOOSE LEAF

Printed on loose leaf, 6 hole, 6 3/4" x 3 3/4" bond paper, each book contains \$1.25 each about 140 pages of technical data, presenting condensed, accurate and essential material for the engineer, technical worker, teacher, student and business man.

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LEFAX PUBLISHERS Dept. CP-13, PHILA. 7, PA.

When inquiring check CP 2464 opposite last page

CHEMICAL PROCESSING



HERCULES CORK CUSHIONED *Aero* RUBBER CUSHIONED CARBOY BOXES

6 1/2
GALLONS

Treen manufactured 5-6 1/2- and 13 gallon carboy boxes are quality built in accordance with ICC regulations, with features that give all-point protection; reducing hazards and breakage, ease in handling and compact loading.

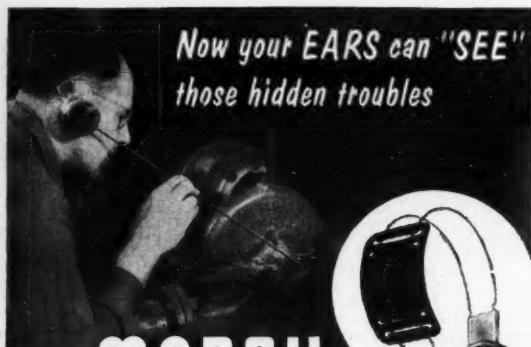
WRITE FOR COMPLETE DATA

TREEN BOX COMPANY

TIOGA AND MEMPHIS STS., PHILADELPHIA 34

"Aces in Cases" for over 50 years

When inquiring check CP 2465 opposite last page



Now your EARS can "SEE"
those hidden troubles

NEW MARSH

Serviceman Soundscope

... cuts servicing and maintenance costs

Most effective instrument ever developed for pin-pointing and identifying mechanical defects. Saves time and dollars tracking down troubles in bearings, gears, mechanisms . . . detects leaks, knocks, piston slaps—any defects that make a sound. A precision instrument of Marsh quality, sensitive to faintest sounds . . . with handy probe and headband as illustrated. A remarkable tool, moderately priced.

Ask
for
Circular

MARSH INSTRUMENT CO.

Sales Affiliate of Jas. P. Marsh Corporation

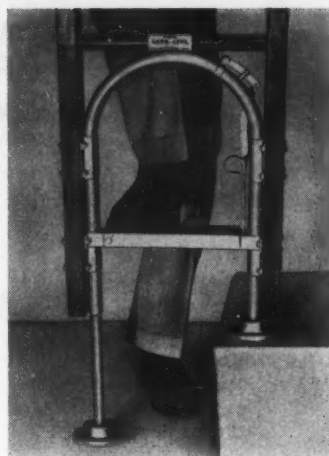
Dept. Z, Skokie, Illinois

Marsh Instrument & Valve Co. (Canada) Ltd., 8407 103rd St.,

Edmonton, Alberta, Canada

When inquiring check CP 2466 opposite last page

SAFETY



Aluminum device adjusts to full
9 1/2" stair riser

upright securely. Slipping is prevented by non-skid, swiveling feet. Since support is given to both rails of ladder, cornering stresses are reduced. For use on stairways, its legs take a full 9 1/2" riser. Unit is of aluminum alloy, is manufactured to a 1000-lb load test, weighs 5 lb.

(Ladr-Levl is product of H-B Industries, Inc., Dept. CP, 1401 Middle Harbor Road, Oakland, Calif. . . or for more information check CP 2467 on form opposite last page.)



Cartoon above is reproduction of National Safety Council poster 0399-A. For information write National Safety Council, Dept. CP, 425 N. Michigan, Chicago, Ill.

Production Bottleneck

100% fire safety, 100% of the time is the responsibility of administrative and plant operating management alike. A small fire can become a big fire . . . a business-destroying fire, when maximum protection is not provided 24 hours a day, every day of the year.

No protective method yet devised exceeds the value of ENGINEERED "Automatic" Sprinkler PROTECTION. It never tires—never sleeps—never takes time off. It's always ready to feel fire . . . to shout fire . . . to kill fire, whenever your plant production is threatened.

No one profits from fire loss, but you can profit in more ways than one, when ENGINEERED "Automatic" Sprinkler PROTECTION safeguards production bottlenecks in your business. Let us show you how!

"Automatic" Sprinkler

CORPORATION OF AMERICA
YOUNGSTOWN, OHIO

Offices in principal cities of North and South America

**completely
non-sparking
-easy
to handle**

**aluminum
ladder**

by

ALCO-LITE

**weighs
slightly more
than 1 lb.
per foot!**

lengths — 16' to 24'
weights — 19 lbs. to 27 lbs.



**RUNGS WON'T TWIST,
TURN OR BREAK OFF.**

Corrugated 1" tubular aluminum rungs are permanently attached to the side rails with exclusive ALCO-LITE gusset plate and expansion bushing construction.

Won't rust, rot, burn, or splinter!

The DLL Extension Ladder is the lightest — easiest to use ALCO-LITE extension ladder made. Because it is non-sparking it is completely safe around inflammable material. It easily supports a 500 lb. load and more than meets the rigid code and tests of the ASA and Metal Ladders Association. Lasts for years with almost no maintenance. WRITE FOR DETAILS!

ALUMINUM LADDER COMPANY
Dept. A1
Worthington, Pa.

Please send me further details about the DLL Extension and other ALCO-LITE Aluminum Ladders.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

When inquiring check CP 2469
opposite last page

SAFETY

**Triggered by heat — fights fire
in three separate stages . . .**

wall-mounted unit releases fluid as fuse melts,
breaks grenade

Uses: Automatic or manual fire extinguisher.

Features: Extinguisher combats fire in three stages. As liquid comes in contact with fire, or heat produced by fire, a "flash fog" is released before fluid reaches its average boiling point of 152.5°F. At boiling point, material is vaporized into dense extinguishing fog. A portion of the



Unit mounts on ceiling or wall, releasing fluid on exposure to heat of fire

fluid remains unvaporized. This vaporizes at a higher temperature which produces a "residual fog" should re-ignition or flash-back of fire occur.

Description: Units are installed on walls or ceilings. Heat from fire releases fuse in base of unit, instantly releasing smasher-slug. This slug shatters hermetically sealed glass grenade fluid. Fluid sprays downward and outward, expanding into a dense fog blanket.

(Red Comet Automatic Fire Control Systems are produced by Red Comet, Inc., Dept. CP, Red Comet Bldg., Littleton, Colo. . . or for more information reader may simply check CP 2470 on form which is located opposite last page.)

FOR FLEXIBLE CONNECTIONS

IN

- DUST COLLECTION ● FUME CONTROL
- AIR-CONDITIONING ● MATERIALS HANDLING

PORTOVENT®
Spiral wire reinforced

USE

FLEXAUST®
Spiral wire reinforced

DUCT



Sizes 3" to 36" ID
Wide Pitch type
RETRACTABLE

Flexaust hoses and Portovent ducts are made with strong cotton or nylon fabrics, impregnated and coated with neoprene compounds. Seams are fully bonded. Other important features are—

- ✓ EXTREME FLEXIBILITY
 - ✓ AIRTIGHT — STRONG
 - ✓ LIGHTWEIGHT — DURABLE
 - ✓ VERY EASY TO HANDLE
- AND INSTALL

DISTRIBUTORS IN PRINCIPAL CITIES

HOSE



Sizes 1 1/4" to 36" ID
Close pitch type

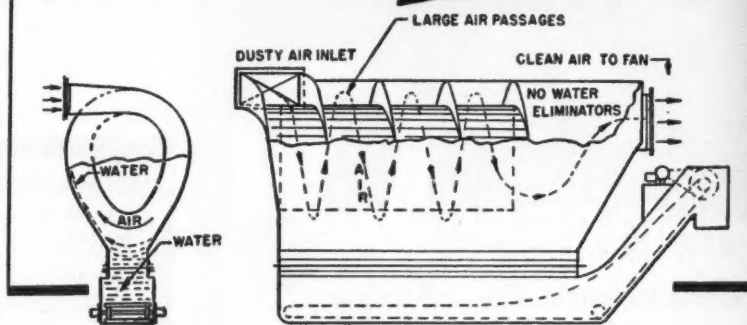
WRITE TODAY FOR

- Bulletin #40 — General Information
 - Bulletin #41 — Accessories and Installation Data
 - Bulletin #42 — Technical data on products and service.
 - Bulletin #43 — Application data and type selector guide.
 - Bulletin #44 — Friction loss data.
- Price lists.

THE FLEXAUST COMPANY, Dept. CP-12
100 PARK AVENUE NEW YORK 17, NEW YORK

When inquiring check CP 2471 opposite last page

THIS IS THE . . . **Air Tumbler**



the master of DUST in industry * * *

**SIMPLE—DEPENDABLE
NO FIRE HAZARD
HIGH EFFICIENCY
CONSTANT CAPACITY
LOW OPERATING COST**

Write for Bulletin No. 551. Address:

DUST SUPPRESSION & ENGINEERING COMPANY

P. O. BOX 67, LAKE ORION, MICHIGAN

Agents in all principal U. S. cities

When inquiring check CP 2472 opposite last page

CHEMICAL PROCESSING

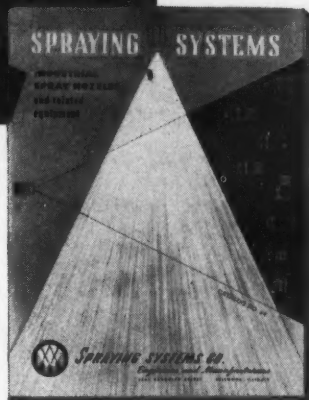
SPRAY NOZZLE

REFERENCE
MANUAL

SPRAYING SYSTEMS

• to help you
improve a
spraying
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lower a
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The most complete industrial spray nozzle catalog ever produced. Gives you reference data on thousands of standard and special spray nozzles for every type of spraying.

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SPRAYING SYSTEMS CO.
3216 Randolph St. Bellwood, Illinois

When inquiring check CP 2473 opposite last page

FOR MAXIMUM SAFETY

all
over
your
plant
use

Safety
GRIP-STRUT



Important Safety Features

- ★ Fire proof
- ★ Slip proof
- ★ Maximum strength
- ★ Minimum weight
- ★ Easy to stand on
- ★ Cool in summer — warm in winter

Big Economy Features

- ★ For balconies—no extra light needed below—no extra heat.
- ★ No secondary sprinkler heads needed
- ★ Self-cleaning
- ★ Cut and installed like lumber by your own maintenance force
- ★ Low in original cost
- ★ No extra supports necessary—channels are integral part of the material

GRIP-STRUT division
THE GLOBE COMPANY • Manufacturers since 1914
4006 S. PRINCETON AVE. • CHICAGO 9, ILL.

When inquiring check CP 2474 opposite last page

write for
your free
copy today

SAFETY

**Eliminates loose hose
as hazard**

To prevent the dangers inherent in having loose, tangled hose lying around traffic lanes and work areas, hose reel has been developed to keep hose out of workers' way.

Reel is available for hose up to 3" in diameter in models with air- or explosion-proof electric motor or hand crank rewind.

Reels can be mounted on cabinet or on wall or girders near work areas. When hose is not in use, it is quickly rewound on hose reel. Starting button on electric models can be placed anywhere convenient, while lever on air-motor models and cranks on hand-crank models are within easy reach of operator.

Rolled edges on discs and a full drum protect hoses from scuffing and cutting.

(Hose reel is a product of Clifford B. Hannay & Son, Inc., Dept. CP, Westerlo, N. Y. . . or for more information check CP 2475 on form which is located opposite last page.)

**Interchangeable lenses
snap into place
without tools . . .**

safety spectacles can be used for many purposes

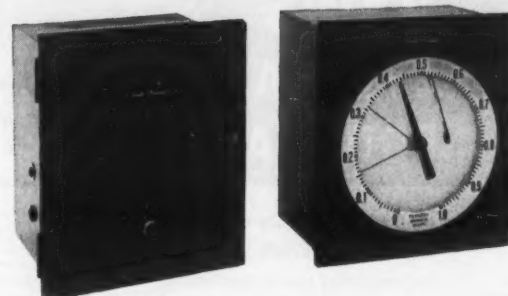
Interchangeable lenses, which are snapped into place without tools, permit frame of safety spectacles to serve more than one purpose.

To provide protection from impact, clear lenses are provided.

For average sunlight and glare, light green lenses are available; for bright sun and extreme glare, medium green lenses. All lenses are shatter-proof Methacrylate.

(Spectacles are a product of the Watchmoke Optical Co., Inc., Dept. CP, 232 W. Exchange St., Providence 3, R. I. . . or for more information check CP 2476 on form which is located opposite last page.)

NEW SAVINGS in your operations with Arnold O. Beckman OXYGEN ANALYZERS



*Pictured is the Model G2 Recording Analyzer—
finest for precise oxygen measurement.*

ON OPERATIONS LIKE THESE . . . MAKE SAVINGS LIKE THESE

PROCESSING
AIR LIQUIFICATION AND
PRODUCTION OF HIGH PURITY GASES

Better product quality
with minimum oxygen or
air contamination

SAFETY
PRODUCTION OF HYDROGEN,
ACETYLENE, ETC.

Control explosive atmospheres,
reduce fire risks, minimize plant
and personnel hazards

PRODUCT PROTECTION
RESIN KETTLES, COLOR PIGMENTS,
PRODUCT STORAGE, ETC.

Reduce oxidation, maintain
product standards with
controlled purge systems

Unique Operating Principle

The various applications highlighted above are only a few of the many ways Arnold O. Beckman Oxygen Analyzers—industry's great new profit builders—are being used by progressive operators to boost profits, cut costs.

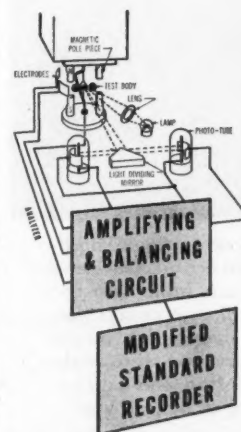
These are the *only* oxygen analyzers that *continuously* measure process streams by an advanced magnetic principle that provides *direct physical measurement of the oxygen itself*—not of some secondary relationship.

Heart of the unit, as illustrated, is a dumbbell-shaped test body suspended in a magnetic field. Sample gas surrounding this test body causes it to rotate in the field, depending upon the oxygen content of the gas. The movement of a light beam, reflected by a small mirror on the test body, is measured by simple electronic circuits . . . and the result indicated directly on a conventional recorder or indicator. It's simple, positive, accurate!

*No chemicals—filaments—catalysts
cams—complicated mechanical parts!*

Send for Helpful Free Literature which describes this unique operating principle in detail—explains its many advantages and applications. When writing, outline your particular operations—we'll gladly supply specific information.

Ask For Data File 15H-125



FEATURES OF THE G2

Many ranges: Full scale ranges 0-0.1%, 0-0.5%, 0-1% O₂ and others for low O₂ concentrations. Ranges 90-100%, 95-100% O₂, etc., for high O₂ concentrations.

Multi-Ranges: Any instrument may be supplied with two or more ranges.

Note: For ranges wider than 0-5% O₂, ask about the Model F3 Analyzer.

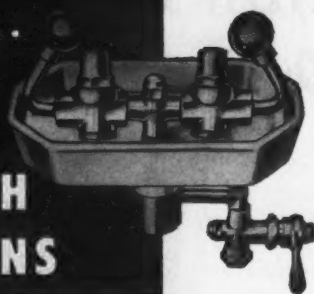
Arnold O. Beckman
Instruments for Science and Industry
1020 MISSION STREET
SOUTH PASADENA, CALIFORNIA

When inquiring check CP 2477 opposite last page

Approved by
Safety Engineers...



HAWS EYE-WASH FOUNTAINS



... offer a way to more adequately protect employees' eyesight and avoid costly insurance claims... by providing a safe method for workers to flush injurious chemicals and particles from their own eyes immediately—before greater damage can be done!



And, wherever there is danger of workers' hands, face or clothing being contaminated by acids or caustic chemicals—Install HAWS Emergency Drench Shower Equipment.

Cost is negligible. Ask your plumbing contractor, or write today for complete information.



HAWS DRINKING FAUCET CO.
1439 FOURTH STREET • BERKELEY 10, CALIFORNIA

When inquiring check CP 2478 opposite last page



HIGH PRESSURE VESSELS

Whether you want conventional high-pressure units or something *special*—send us your inquiries. COLE can build you the kind of high-pressure tanks or vessels you require—any size, any shape, any metal. Our experience of a century (we were established in 1854) in the design and fabrication of metal tanks may be of help to you.

Send us your inquiries for tanks of all kinds. Write for Catalog—Tank Talk.



Manufacturing Co., Newnan, Ga.

When inquiring check CP 2479 opposite last page

SAFETY

Vehicle's exhaust tamed by catalytic action

Muffler removes up to 90 per cent of contaminants in fumes

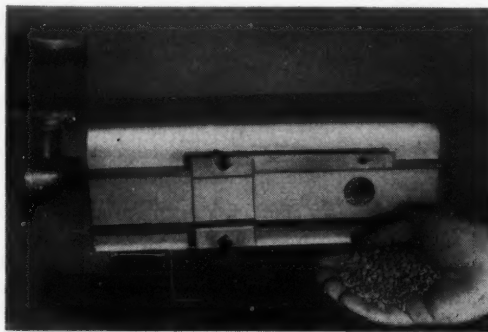


Unit, replacing vehicle's acoustical muffler, may be installed without major alterations to truck

Uses: Removes as much as 90 per cent or more of carbon monoxide and most of the aldehyde and hydrocarbon fumes in engine exhausts by catalytic burning. For use on fork trucks, power sweepers, and other vehicles to be operated in enclosed plant areas.

Features: Unit, designed as direct replacement for vehicle's acoustical muffler, can be quickly installed without major changes or adjustments.

Description: Inside muffler, in a horizontal row, are a number of chambers, each containing beds of catalyst pellets. Fume-laden exhaust gases enter muffler through inlet section. Venturi in the inlet sucks in enough air to support combustion of exhaust contaminants. Hot gases flow through pellet beds where they come in contact with cata-



Muffler contains a number of chambers, each holding beds of catalytic pellets

FOR COMPLETE PROTECTION AGAINST...



Styles illustrated
50-00 Jacket
51-05 Pants
53-15 Hat

Protective Clothing by Sawyer

Wears like iron — takes endless rubbing, scraping, snagging, and still gives full protection.

100% Waterproof — made with top quality base fabric saturation-coated first and then coated with 6 coats of Neoprene Latex.

Positively will not blister, crack or peel. Its longer lasting quality means greater economy.

Also: Three-quarter and long coats, aprons, coveralls and many other styles. All clothing made in black or yellow.



Cambridge, Massachusetts

When inquiring check CP 2480 opposite last page

CHEMICAL PROCESSING

SAFETY

lytic agent. They are burned by catalytic chemical action to a safe, odorless exhaust of carbon dioxide and water vapor.

Basic principle of the muffler is chemical action of catalytic agent which permits highly efficient combustion of carbon monoxide, hydrocarbons, aldehydes and other exhaust fumes at temperatures far below their normal combustion points. Burning occurs without flame.

Muffler is available in three basic sizes for engines with piston displacements ranging from 0-75, 76-150 and 151-230 cubic inches. All parts in contact with gases are of stainless.

(Oxy-Muffler is produced by Oxy-Catalyst, Inc., Dept. CP, Wayne, Pa. . . . or for more information check CP 2481 on form which is located opposite last page.)

Indicates fire stations, exits, aisles without paint . . .

characters, with pressure-sensitive backing, adhere to any clean, dry surface

Uses: For marking fire stations, exits, aisles, etc. May also be used for numbering warehouse sections, bins and similar applications.

Features: Characters have pressure-sensitive ad-



Characters are available in two colors: black on white and black on yellow

hesive, come mounted on handy dispenser cards which protect adhesive until used.

Description: Numbers and letters are available in two colors: black on white and black on yellow. Characters come in six sizes: $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$, $2\frac{1}{4}$, $3\frac{1}{2}$ and 5". Costs run from 1/5 of a cent per marker. (Markers are product of W. H. Brady Co., Dept. CP, 727 Glendale Ave., Milwaukee 12, Wis. . . . or for more information check CP 2482 on form opposite last page.)

If Solids Recovery is . . .



...Sharples has 3 Money-Saving Answers

Whether your problem is to recover an extremely small quantity of solids from a liquid . . . produce tons of dry crystals per hour continuously . . . rough out solids as a process step . . . or remove all undesirable solids from a slurry—there is a type of Sharples centrifuge to do the job continuously, and at low cost.

Only Sharples gives you the advantage of approaching your problem with the three basic centrifuge types (disc, scroll and basket) from which to choose—



The Heavy Duty DH-3 Concentrator.



The New High Speed Sharples Super-D-Cantor.



The High Capacity Sharples Super-D-Hydrator.

Sharples is able to recommend, without bias, the best centrifuge for your solids recovery problem because we make all of the basic types, and have long experience with them.

We'll be glad to send you a copy of Bulletin 1259 which describes the complete line of Sharples Centrifuges.

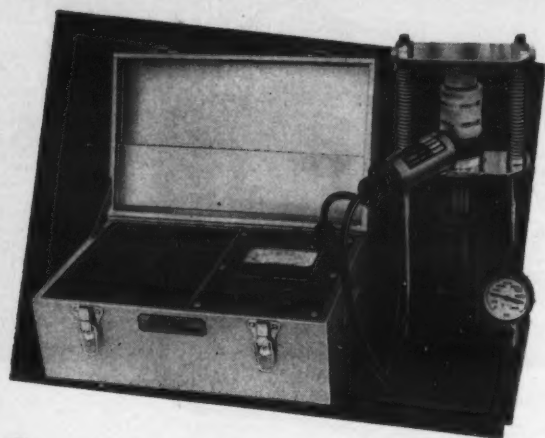
A PROVING GROUND FOR BETTER PROCESSING

Sharples maintains a completely equipped centrifugal test laboratory for industry. Any of the nine basic types of Sharples centrifuges can be applied to your problems under conditions which closely parallel plant operating conditions. You are invited to make use of these exceptional facilities.



THE SHARPLES CORPORATION
2300 WESTMORELAND STREET • PHILADELPHIA 40, PENNSYLVANIA
NEW YORK • PITTSBURGH • CLEVELAND • DETROIT • CHICAGO • NEW ORLEANS • SEATTLE • LOS ANGELES • SAN FRANCISCO • HOUSTON
Associated Companies and Representatives throughout the World

When inquiring check CP 2483 opposite last page



Is improper moisture in your products...

adding to operating expense? ☐ yes ☐ no

slowing production for tests? ☐ yes ☐ no

bringing customer complaints? ☐ yes ☐ no

Any yesses? Then it will pay you to find out how the Granular Moisture Register model G5, operating on high frequency power loss principle, will indicate moisture content quickly and dependably, help solve those problems with ... **1-minute tests on the spot!** • **Practical Accuracy Guaranteed!** • **No skilled technicians!** • **Two weeks free trial!** • **Most granular products** such as:

Ammonium Nitrate • Ammonium Sulphate • Toilet Soaps • Plastic Molding Compound • Polyvinyl Chloride • Ammonium Perchlorate • Sodium Bicarbonate • Polyethylene Resins

DOZENS MORE

ELECTRONIC MOISTURE REGISTER

Dept. CPB Instruments

Moisture Register Co., P. O. Box 910, Alhambra, Calif.

☐ We are interested in 2 weeks free trial offer. Send additional information regarding Model G5.

We will want to test

in a moisture range from _____ % to _____ %.

Firm Name _____

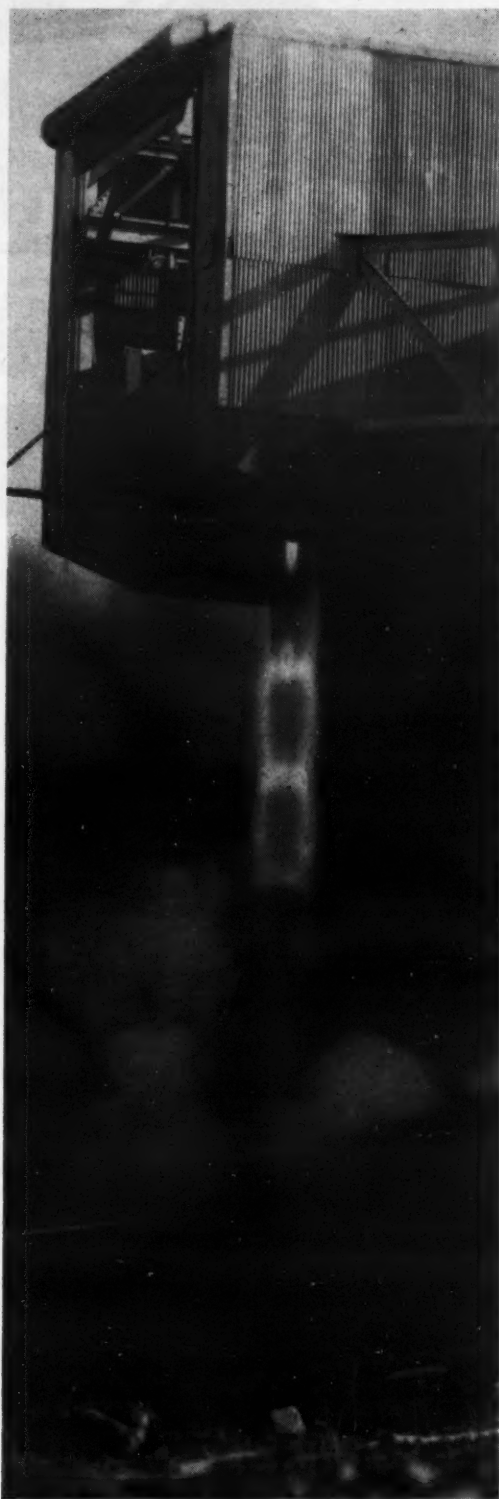
By _____ Title _____

Address _____

City _____ State _____

When inquiring check CP 2484 opposite last page

instrumentation & control



A behemoth rocket engine gets a workout on the large test stand at Reaction Motors' proving ground

Few chemical plants face the metering problems which Reaction Motors, Inc. has solved in proving rocket power units. Their research calls for —

Metering accurately despite

- wide flow range
- wild fluctuation
- corrosives
- extreme temperatures

By **BRUCE FADER**, Associate Editor
with **JOHN REDMOND**, Facilities Manager
Reaction Motors, Incorporated

Problem: Rocket engine testing is an exacting and expensive business. When Reaction Motors, Inc. puts a power plant in one of the test stands at its proving ground near Picatinny Arsenal, expensive chemical fuels roar through the system in pounds per second and tons per minute. With every second of test-run time this valuable, there's none wasted in "settling down." Steady state is something that lasts for a minute or less.

During a rocket test one or more of these liquids must be accurately metered: liquid oxygen, liquid ammonia, red or white fuming nitric acid, hydrocarbons, concentrated hydrogen peroxide. Liquefied gases run through flow meters at their characteristically frigid temperatures. Liquid oxygen precludes use of regular lube oils in direct contact with it because it explodes on contact. Furthermore, bubbles of gas in the liquids now and then can drive readings off scale or ruin delicate sensing elements.

First attack on this problem was made with conventional orifice flow meters. Gas build-up in tap flow meter lines from high-vapor-pressure liquids produced inconsistent data. In addition, visual averages of fluctuating readings were almost always high because of the square root differential pressure characteristics. Rotameters were also tried.

But for flow rates encountered these meters were

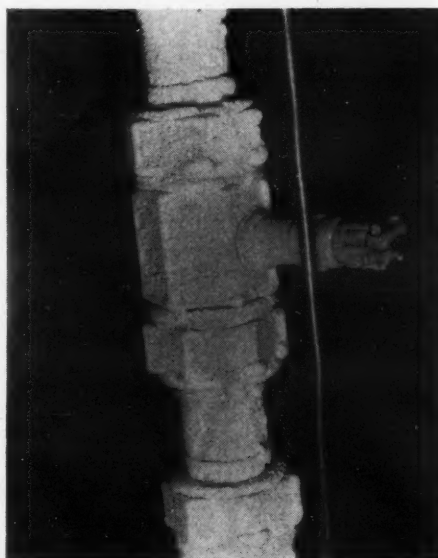
so large that they acted as heat reservoirs and boiled off liquefied gases. By 1948 RMI was experimenting with such messy schemes as mounting rotameters *inside* tanks of liquid oxygen and attempting to read them there during runs.

Solution: In 1948 a switch was made to a turbine flow meter element. Built in several line sizes, this element embodies a small propeller-like rotating member held axially in the flow stream. A magnet is enclosed in hub of the rotor so that rotor revolutions can be counted as magnetic field swings past an inductive pickup sealed in the meter's wall.

Output signal of this device is an alternating current whose frequency is linearly proportional to volumetric flow rate. While for most purposes a flow element is chosen to match the line size, a smaller unit can be mounted in a large pipe where needed for minimal flow rates without sacrificing signal strength or accuracy.

For most service in rocket testing, aluminum bodies with stainless impellers have been found satisfactory. One further material has been used in later models — Teflon. This has been added in an effort to provide self-lubricating bearings with a fairly consistent temperature coefficient. Lubrication provided by the Teflon has been found helpful in cases where large gas bubbles run through these meters — formerly the tremendous velocity of such gas surges were enough to burn out steel and roller bearings. Though this still happens occasionally with Teflon bearings, a considerable

(Continued on next page)



This flow element is handling liquid oxygen at -297°F . It continues to function accurately despite a heavy accumulation of frost

WHAT'S NEWS AT BRISTOL . . .

FIRST instrument system that carries out BASIC-GRAPHIC PANEL idea completely!

A WIDE SELECTION: For example, there are 35 receiver and 34 controller models and the widest variety of transmitters on the market. A model can be found among these that will exactly meet any requirement.

FULL PLUG-IN SERVICE: Change recorder to an indicator or vice versa in 10 seconds with **ABSOLUTELY NO INTERRUPTION WHATSOEVER TO AUTOMATIC CONTROL.**

Pull complete chassis out (one-piece chassis — no tools required). With chassis removed you get the same automatic control as before.

Change from one model to another or if trouble is suspected in a plug-in unit, the doubtful unit can be replaced by a spare while the suspected unit is checked in the service shop — out-of-service time is thus eliminated.

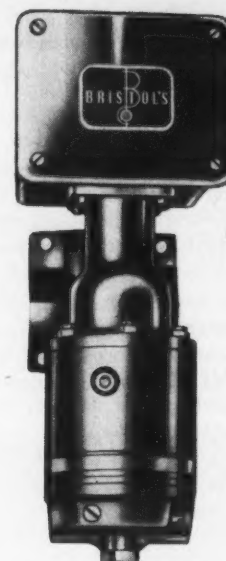
CONTINUOUS VALVE POSITION INDICATION on same instrument scale as set point scale, gives continuous data on control valve position — makes "bumpless" transfer possible simply by matching pointer positions — no need to read actual scale values — minimizes reading errors — speeds operations.

SCALES ARE SCIENTIFICALLY DESIGNED for instant, error-free readability — a new degree of close-up, as well as distance readability.

Write today for more details. The Bristol Company, 141 Bristol Road, Waterbury 20, Conn. 5.14

METAGRAPHIC INSTRUMENTS MEASURE, RECORD, INDICATE, AND AUTOMATICALLY CONTROL

Pressure • Vacuum • Absolute Pressure
Differential Pressure • Liquid Level • Flow
Temperature and • Mechanical Motion



1

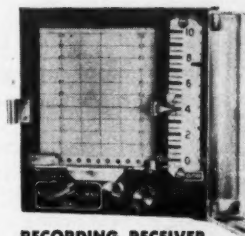
METAGRAPHIC TRANSMITTER

SUPPLIED IN A VERY WIDE VARIETY OF SPANS AND RANGES: For example, absolute pressure instruments are made in ranges as low as 5mm mercury absolute. Pressure instruments as low as 5 inches water to 10,000 psi. Over-range protection available up to 400% over-range.

NO INTERRUPTION WHATEVER TO AUTOMATIC CONTROL when receiver chassis is removed.

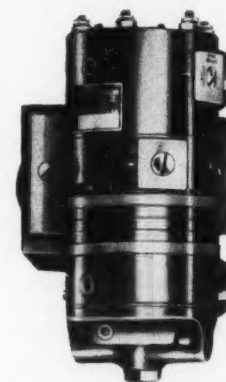
OFFERED FOR UP TO THREE MEASURED VARIABLES — with air pressure regulators or air loaded regulators — three-position manual-automatic transfer valves for automatic control and six-position (on the same knob) transfer valves for cascaded control.

2



RECORDING RECEIVER

3



CONTROLLER

VARIETY AND FLEXIBILITY: The most flexible and complete line of controllers offered — 34 different models.

PLUG-IN FLEXIBILITY: Controllers are designed for full plug-in interchangeability for change of control mode or service. This means no process down-time for maintenance — no off-specifications product.

BRISTOL

**POINTS THE WAY IN
HUMAN-ENGINEERED INSTRUMENTATION**

BRISTOL'S

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 2485 opposite last page

METERING ACCURATELY

(Continued from preceding page)

improvement in reliability has been noticed.

Results: These meters have proved so satisfactory that they have become standard for this testing application. Linearity and excellent averaging characteristics have provided better than 1% accuracy at recording units.

While maintenance has not been unduly high, need for rapid flow meter replacement to meet changing specifications and the retention of high flow accuracy has led RMI to set up its own maintenance shop and flow calibration system for these sensing elements. Manufacturer does not recommend this procedure for most applications. Reaction Motors, Inc. finds that most maintenance effort on the elements results from repeated exposure to high-transient, short period operations normally encountered in rocket testing.

(Flow elements were designed and are built by Potter Aeronautical Co., Dept. CP, P. O. Box 532, Route No. 22, Union, N. J. . . . or for more information check CP 2486 opposite last page.)

**Senses temperature accurately
without amplification . . .**

error is within one per cent at 1300°F, within one-half per cent under 600°F

Uses: Measurement of temperatures between 32 and 1300°F.

Features: Accuracy is 1/2 of 1% of measured temperature between 32 and 600°F, $\pm 1\%$ from 600 to 1300°F.

Description: Resistance thermometer is designed to be connected to remote indicators or other instruments with ordinary copper wire. There is no length limitation on lead wires. High resistance of the element (100 ohms at 32°F, 359 ohms at 1380°F) obviates need for electronic amplification. It can be used with resistance-bridge instruments.

Element is hermetically sealed in steel alloy tube. Three leads run to it. Third lead brings power directly to the resistance element, nullifying effects of lead wire resistance.

Stem diameter of sensing element is 0.365" (fits standard 3/8" ID thermowell). Detector may be used alone at pressures to 300 psi. Thermowell is recommended for high pressure or very corrosive service. Stem lengths may be chosen in the range from 8 to 44".

(Model 242P resistance temperature detector is a development of Thomas A. Edison, Inc., Instrument Div., Dept. CP, 51 Lakeside Ave., West Orange, N. J. Check CP 2487 opposite last page.)



Masoneilan PLUS

**"These Exclusive
Better Service, Gr**



**SPECIFICATIONS:
777 SERIES CONTROL VALVE**

Material:	Cast steel or cast iron
Size:	1" to 6"
Connections:	Flanged
Rating:	Cast steel — ASA 150, 300, 400, 600 lb. Cast iron — ASA class 125, 250

Available with direct motor (No. 777-19) or reverse motor (No. 778-19) and with finned bonnet construction.

ALL HIGH  PRODUCTS

lan **PLUS values . . .**

Design Features Insure Greater Flexibility"

Here are the three big reasons you get more for your money with Masoneilan angle valves . . .

REVERSIBLE SEAT RING has ground and lapped gasketless joint assuring accurate centering, vertical alignment and tightness. Provides new seating surface quickly when needed, shortens downtime.

REDUCED CAPACITY plugs and seat rings available in .4 Factor standard reduction. Also in .7 Factor for added flexibility in 6" valves used in high pressure-drop service; and in .4² Factor (capacity ratio .16); and in .4³ Factor (capacity ratio .06) for use on small flow applications.

PLUG GUIDING IS HEAVY DUTY, large diameter guide section with minimum length of two guide diameters operating in hardened stainless steel bushing.

Masoneilan 777 series Control Valves are well suited for slurry service, in heater drainer service where flashing may occur, and on soot blower applications. Their streamlined, non-clogging inner contours cut down erosion and reduce turbulence.

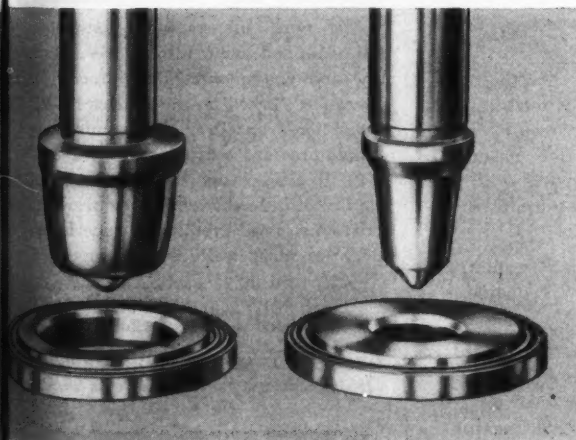
It will pay you to get the story on *all* Masoneilan Control Valve *plus* features. They add up to extra value and true cost reduction. Call your nearest Mason-Neilan representative or write:



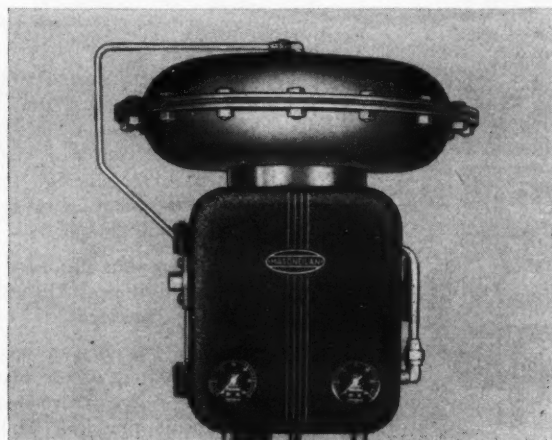
MASON-NEILAN REGULATOR CO.

1203 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia
Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City
El Paso • Albuquerque • Odessa • Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham
New Orleans • Dallas • Seattle • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto



Full capacity and .4 Factor plugs and seat rings are interchangeable in standard body, as are other reduced capacity plugs and seat rings. They are all precisely sized for accurate fit and alignment.



New 2800 series (Model 2807 shown) Pressure Controllers offer (1) fast response, (2) high sensitivity, (3) low cost and (4) proportional band of 1 to 30%.

When inquiring check CP 2488 opposite last page

DECEMBER, 1955

INSTRUMENTATION & CONTROL

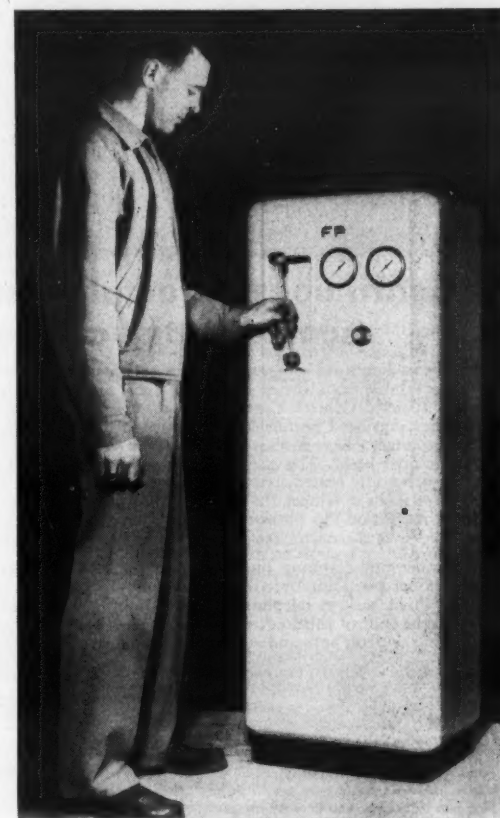
Introduces chlorine over wide range of flow rates . . .

hits accuracy of plus-or-minus four percent over five-to-one range

Uses: Addition of chlorine for purification of water supplies, sewage and industrial wastes.

Features: Unit has capacity of 0.1 to 1000 lb per day of chlorine. Hits accuracy of plus-or-minus four percent over five-to-one range.

Description: Chlorinator is vacuum-operated, with water flow through ejector assembly producing vacuum. Spring-opposed diaphragms regulate



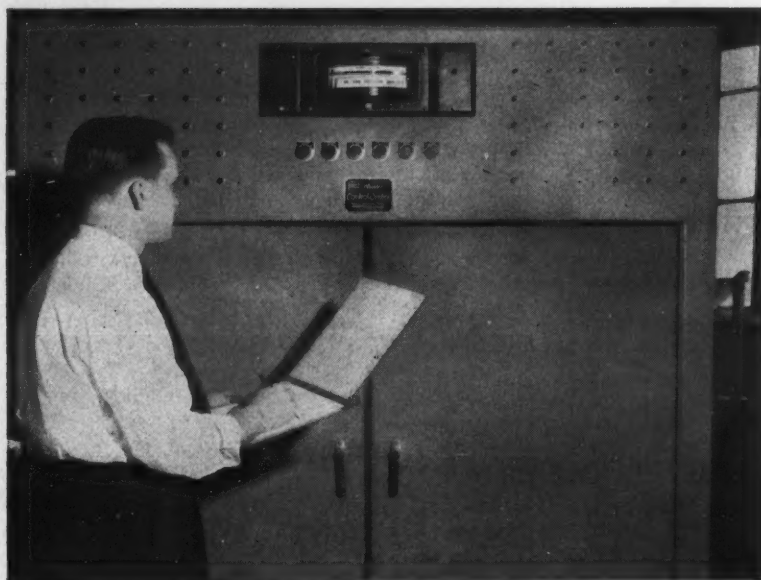
Chlorinator weighs 70 lb, is constructed of corrosion-resistant materials

flow of chlorine in vacuum system. Unit weighs 70 lb. Corrosion-resistant materials used throughout system include polyester-glass laminated cabinet, Uscolite tubing and regulator housing, silver tubing, tantalum plugs, Teflon valve seats, Kel-F diaphragms, and Monel bolts and washers. Highly corrosive chlorine-water mixture is not formed until chlorine has reached ejector assembly.

(Model 1050-A chlorinator is product of Fischer & Porter Co., Dept. CP, Hatboro, Pa. . . or check CP 2489 on form opposite last page.)



Wheelco Control Centers



For continuous automatic temperature scanning and control

Continuous automatic temperature scanning and control can now be obtained with remarkable flexibility of arrangement and maximum space economy through use of Wheelco Control Centers. These versatile units offer many advantages including: improved performance of instruments; increased safety; and unparalleled accuracy. Shown above is one of six units recently installed in a large synthetic fiber plant. The control problem was sensing and regulating temperature of electrically heated shoes on draw twisting machines. Nylon yarn is drawn over these shoes to temper the material, and correct temperature is critical to the process. A total of 156 control points is covered in this installation. Each shoe is controlled by a thermistor sensing element operating through a single controller.

The temperature scanning phase of the system scans continuously at a rate of three seconds per point, over the sequence of 156 points. A thermocouple in each shoe is wired back to telephone-type stepping switches, with a numbered neon light on the control panel corresponding to each shoe. An abnormal temperature will light the neon bulb and actuate an audible signal, if desired.

This is one of many temperature control applications for Wheelco Control Centers. Your Wheelco field engineer will be glad to analyze your temperature control requirements to see where these versatile units can offer effective control.

"PLUG-IN" CONTROLLERS

These ingenious plug-in controllers are quite small in size, measuring only 3 by 3 by 4 inches. They plug into subpanels, and here 39 are mounted on a panel 30 by 36 inches. Each cabinet contains four panels.

Plug-in design connects each control unit to its power supply automatically when the unit slides into operating position. This assures a complete disconnect whenever the unit is pulled forward for inspection. All units can be locked in "disconnect" position.



WHEELCO INSTRUMENTS DIVISION

Barber-Colman Company

Dept. X, 1520 Rock Street, Rockford, Illinois

BARBER-COLMAN OF CANADA, LTD., Dept. X, Toronto and Montreal, Canada

Industrial Instruments • Automatic Controls • Air Distribution Products • Aircraft Controls • Small Motors • Overdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

When inquiring check CP 2490 opposite last page

INSTRUMENTATION & CONTROL

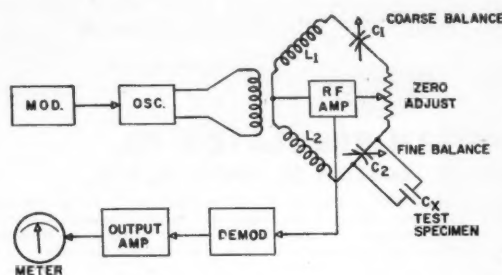
Uses capacitance change to measure moisture, position, strain . . .

sensitive to 300 ppm moisture — can check vibration at frequencies from 0 to 20,000 cps

Uses: A relatively new device, this capacitance meter can be used wherever a measurement may be based on changes of electrical capacity, or mechanical movements which can cause capacity changes. Thus it will measure moisture content (based on the difference in dielectric constant between wet and dry materials), position of conductors, strain (where some electrical conductor can be made to move proportionally to strain), and so forth.

Features: Sensitivity is high. In use it has been found capable of registering changes as small as 0.001°C as a temperature indicator, one-millionth of an inch as a micrometer.

Description: Basic circuit of this instrument includes a 450 kc oscillator modulated by 2.4 kc. Output is coupled into a split coil with half in each of two legs of a bridge circuit. Two capaci-



Basic circuit of capacitance instrument

tive legs complete the bridge. One of these is used as a coarse balance or range-setting control; the other includes a capacity cell used in making the measurement and a capacitor for fine balance. Zero adjustment of the bridge is made with a potentiometer which couples bridge output to a high-gain RF amplifier.

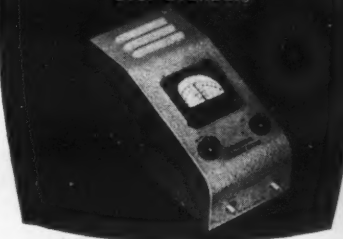
Once zeroed, bridge thus produces an RF voltage proportional to unbalance. This RF is demodulated, rectified, and metered.

Displacement and motion can obviously be followed if applied to one of the plates of capacity cell. Several cell designs have been evolved to make measurements practical. Thus for measuring strain in a specimen, for example, one side of cell is fastened to test member and second side or capacitor plate is fastened a definite distance from the first. As elongation or compression of the member takes place, corresponding changes in capacity can be read from the meter.

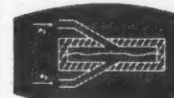
Bellows and diaphragm elements have been rigged

NOW

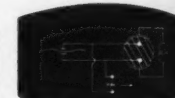
the most sensitive, self-contained differential pressure meter ever available



- Measures a wide range of static and dynamic pressure for gas and other non-conducting fluids.
- Determines pressure, volume, and temperature variations, fluid flow, expansion, absorption, adsorption, chemical alterations, altitude, vacuum, etc.
- Provides one micron of mercury resolution at atmospheric pressure . . . 7.5 volts output available for recording at a full scale differential pressure of 1 mm of mercury.



Pressure differential moves beryllium-copper diaphragm.



Ionization transducer converts motion into electrical signal.



Output applied to cathode follower to drive meter.



Two-knob control for balance . . . sensitivity.

Just plug this compact, completely self-contained meter into a 115V, 60 cy. line and you're *immediately ready for operation*. Based on the famous "T-42" Ionization Transducer, this astonishingly simple pressure instrument, only 5" x 5" x 10" in size, covers the widest range of application. In the laboratory or on the production line, it requires no special accessories, no specially trained personnel.



Details on this new micro-sensitive meter are in Instrument Data Sheet 303-1, available upon request to Technical Literature Section.

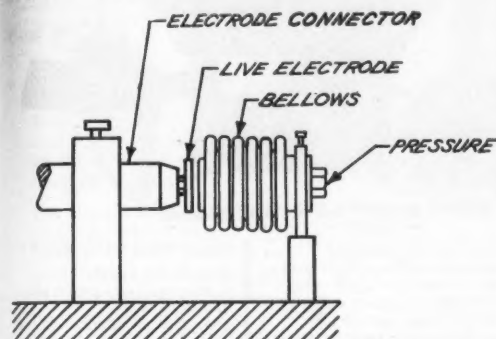
DECKER AVIATION CORPORATION
1361 Frankford Ave., Philadelphia 25, Pa.



When inquiring check CP 2491 opposite last page

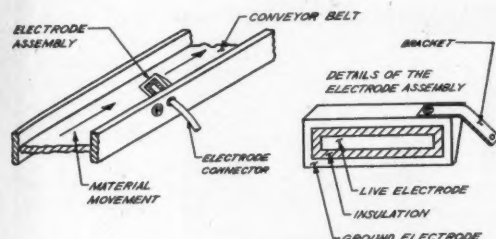
CHEMICAL PROCESSING

up to follow changes in pressure. Paint or insulation thickness can be read if dielectric constant for the coating is known. Where power factor of the dielectric enters this problem, a resistive component can be added to other side of the bridge for true readings.



Bellows converts motion measurement to measurement of pressure

Electrodes have been developed where grounded side of cell is concentric with an insulated center conductor. Such an electrode is suggested for use where moisture content of material is to be measured. Capacity between outer and inner conductors is increased as material with a high dielec-



Special electrodes are available for checking moisture content of flowing materials continuously

tric constant comes in contact with them. Since water has a high dielectric constant, it is easily measured against a low "background" dielectric constant. This scheme might also hold promise where alcohol or other high dielectric constant solvents were to be measured.

Manufacturer's literature explains operating principles and shows several special electrode designs which have been tested. Several more specialized uses are explored also.

(Proximity meter is a development of Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa. . . or for more information about manufacturer's product reader may simply check CP 2492 on the convenient Reader Service slip which is located opposite last page.)

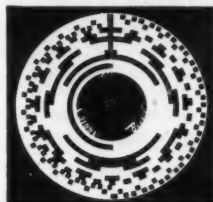
NEW STANDARDS OF ACCURACY AND DEPENDABILITY IN INDUSTRIAL REMOTE CONTROL AND TELEMETERING WITH ...

Bendix-Pacific ELECTRO-SPAN SYSTEMS



TYPICAL INPUT/OUTPUT COMPONENTS

Digital Coders



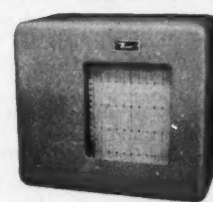
These basic electro-mechanical converters transform shaft settings into electrical code signals for long distance data transmission. They are attached to standard measuring instruments, such as flow meters and tachometers, and to control shafts.

Digital Pressure Gauges



A standard Bourdon tube pressure gauge which serves as a local pressure indicator and as a digital converter for use in transmitting pressure data electrically over long distances.

Digi-Graphic Recorders



A simple digital-to-graphic converter which directly transcribes received digital measurement data into a permanent graphic record.

Visual Indicators

Including digital synchro indicator and decimal lamp register.



Please address inquiries to Department 832

When inquiring check CP 2493 opposite last page

Self-scouring!
SIMPLEX PARABOLIC FLUME
 Measures open flows within $\pm 2\%$
 ...over full 20 to 1 range!
PLANT WASTES • ALKALIES
ACIDS • WATER • SLUDGE



Type S Flume is used alone to indicate flow ... with meter to record, totalize.

Easy to Install! No special approach piping needed. Inlets fit 6" to 36" pipe. Leveling pins simplify field setting.

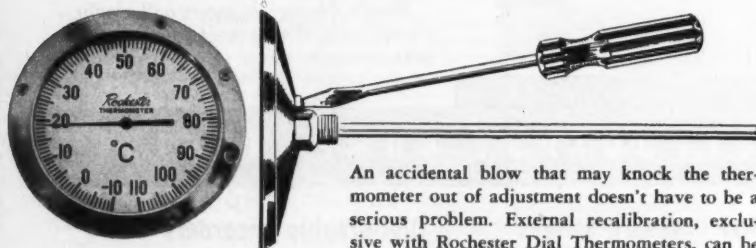
Smooth transition from circular inlet to parabolic outlet speeds flow, keeping flume clear. Big chamber traps sediment, keeps piezometer hole clean.

WRITE FOR BULLETIN 800
 Simplex Valve & Meter Company
 Dept. CP-12
 7 East Orange St., Lancaster, Pa.

Accurate instruments and controls since 1904
SIMPLEX
VALVE AND METER COMPANY

When inquiring check CP 2494 opposite last page

EXCLUSIVE! YOU CAN RECALIBRATE THE ROCHESTER DIAL THERMOMETER EXTERNALLY . . .



stem in any liquid of known temperature and adjust the dial with the set screw attachment. It's done easily and quickly, EXTERNALLY, and is completely accurate. Other plus features include:

- All parts, except the crystal, are of corrosion-resistant stainless steel.
- Hermetically sealed against moisture and grime.
- All readings are completely legible and accurate.
- Precision bi-metal helices precalibrated to dial before assembly.
- Stem position can be located anywhere around circumference of the dial in the STRAIGHT form thermometers.

Your Rochester representative will be glad to give you additional information, or address your inquiries directly to the Rochester Manufacturing Company, Rochester.

Rochester

Manufacturing Co., Inc., 86 Rockwood St., Rochester, N.Y.

DIAL THERMOMETERS • GAUGES • AMMETERS

When inquiring check CP 2495 opposite last page

INSTRUMENTATION

Current controllers for instruments

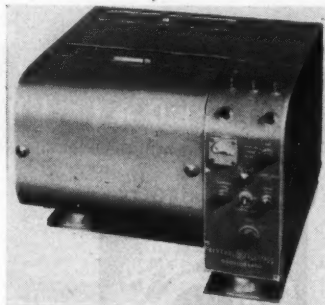
Four-page booklet in two colors describes pneumatic-electric transducer which provides automatic control of current input. Bulletin includes two simplified schematics for typical installations. Applications suggested include maintenance of constant pressure, proportional flow, liquid level, conveyor control, heat treating, constant temperature.

Bulletin EB-1 is issued by Conoflow Corp., Dept. CP, 2100 Arch Street, Philadelphia 3, Pa. When inquiring specify CP 2496 on form opposite last page.

Records 71 variables on same graph . . .

oscillograph's galvanometers respond up to 6000 cps

Uses: When used with suitable transducers, oscillograph will record up to 71 individual variables on same oscillogram. Typical measurements: pressure, vibration, strain, flow.

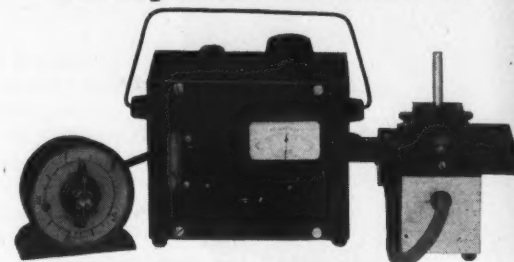


Either conventional or bifilar galvanometers may be used

Features: Wide choice of galvanometers for oscillograph are available. High frequency models are usable to 6000 cps.

Description: Separate mounts are available in oscillograph so that either wound-coil or bifilar galvanometers can be used. Drive system does not use change gears

For continuous, and accurate DUST SAMPLING with permanent records



KONISAMPLER
 (pat. pend.)

Employs principle of thermal precipitation. Light weight — quiet — all electric Automatic timer — will also operate continuously — secures particulate matter suitable for microscopic, electron microscopic or visual and for permanent records on standard glass slides.

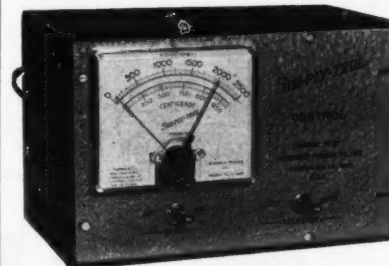
Cost (complete)
 with carrying case \$225.00

Send for descriptive literature K-1
 Designer and manufacturer of continuous gravimetric and oscillating types of thermal precipitators

JOSEPH B. FICKLEN III
 1848 East Mountain St.
 Pasadena 7, California

When inquiring check CP 2497 opposite last page

SIMPLYTROL AUTOMATIC PYROMETER



10 temperature ranges cover from -75° to 3000°F.

Several special ranges to -400°F.

Cat No. 4531 0/2500° F.
 Price \$132.00

Thermocouple type Automatic Pyrometer for controlling temperature in furnaces, ovens, and processes. The Simplytrol is economical and reliable with few moving parts. There are no vacuum tubes. The regular load relay is S.P.D.T. 5 Amps. Optional heavy duty relays to 40 Amps.

10 temperature ranges cover from -75° to 3000° F. Several special ranges to -400° F. "On & Off" control for holding the desired temperature works on gas, oil or electric heat. Indicating meter-relay is medium high resistance and has bimetal cold junction compensation. For use with all standard thermocouples. Accuracy 2%.

"Auto-Limit" switch changes Simplytrol from automatic controller to limit pyrometer for safety shut down or warning. Cabinet: 6½x6½x9½ inches. Also flush panel mount models. Send for new Bulletin G-7 for more data. Assembly Products, Inc., Chesterland 36, Ohio.

Atomic Exposition, Booth 423, Dec. 10-16, Cleveland, Ohio.

When inquiring check CP 2498 opposite last page

CHEMICAL PROCESSING

NEW 72-page GAGE and CONTROL Catalog

..tells where
to use
them..

..WHY
and HOW!

Illustrates instruments
and gages...diagrams
their installation
and on-the-job use...
charts valuable
performance data.

For the efficient
measurement of com-
bustion • draft • pressure •
flow • vacuum • CO₂ • smoke •
velocity • static pressure •
pressure differential •
temperature • and others.



F. W. DWYER MFG. CO.
P.O. BOX 373-K, MICHIGAN CITY, INDIANA

When inquiring check CP 2499 opposite last page

FOR GAUGING LIQUIDS
OF ALL KINDS
• 100% AUTOMATIC
• APPROVED BY
UNDERWRITERS'
LABORATORIES

LIQUIDOMETER

"LIQUIDS WORTH STORING
ARE WORTH MEASURING"
WITH A
LIQUIDOMETER
Tank Gauge

WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.
18-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 2500 opposite last page

DECEMBER, 1955

to obtain record-speed change. Record rate can be varied from 4 to 500 fpm. Interchangeable idler gears provide adjustment over entire range with only seven interchanges of gears.

Models are available to operate from AC to DC.

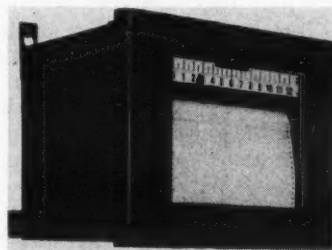
(Model PM-20 Oscillograph is a product of General Electric Co., Dept. CP, 920 Western Ave., Lynn, Mass. . . or check CP 2501 on form opposite last page.)

Switches to right scale as variable runs off

Uses: Produces strip chart record for scale ranges of 0-110, 100-210, 200-310 . . . 900-1010 millivolts.

Features: Maintains high recording accuracy over wide range of values because mechanism automatically switches between ranges whenever record trace runs off scale.

Description: Multi-range strip chart recorder has been designed for applications where accuracy must be maintained over a wide range of small voltages or currents. Range switching is per-

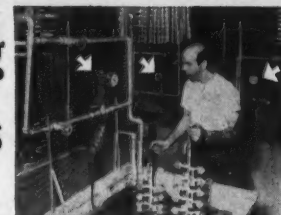


Recorder selects proper scale from ten possibilities

formed by limit switches at ends of recorder slide-wire so that correct higher or lower range is automatically selected when recording pen reaches end of scale.

(Model 39 multiple-range strip chart recorder is a product of Applied Physics Corp., Dept. CP, 362 W. Colorado St., Pasadena, Calif. . . or check CP 2502 on form opposite last page.)

For Plating, Cleaning and Rinse Tanks



POWERS

**No. 11-MF
Self-Operating
TEMPERATURE
REGULATOR**

HAS EASY TO READ 4" DIAL THERMOMETER

PLASTIC COVERED THERMAL BULB AND TUBING
Highly resistant to metal finishing solutions

SIMPLE TEMPERATURE ADJUSTMENT

DURABLE CONSTRUCTION

VALVE STEM LUBRICATOR
Helps give better control, keeps valve stem working freely

EASY TO INSTALL
No insulators required

Simplest, Most Reliable Control Made
Holds Temperature at the Right Point
Savings Often Repay Its Cost 3 to 6 Times a Year

Why Powers No. 11-MF Regulator Gives Better Control and Lasts Longer—better TEMPERATURE Control results from powerful bellows and minimum of valve stem friction. Valve Stem Lubricator aids easy movement of valve stem without binding. Double ply metal used in Powers bellows outlasts ordinary single ply type. Greater durability of plastic covered bulb and tubing also helps prolong the life of the regulator.

Dial Thermometer indicates temperature of solution under control. It gives a visual check of the process and makes it easy to adjust regulator for different temperatures.

Eliminate "the human element" in temperature control with Powers automatic Regulators. They're simple, compact and dependable. They stop OVER-heating, prevent "boil-overs," waste of steam, water wasted by evaporation, burnt plated parts, rejects, decomposition of costly additives and loss of volatile ingredients from cleaning solutions.

Powers Nationwide Service and 24 Hour Delivery in the U.S.A. are important time and money saving advantages. Order a Powers No. 11-MF Regulator now. Call your supply firm or write us direct for Bulletin 330 and prices.

(c48)



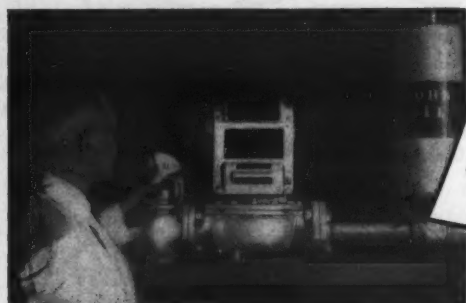
THE POWERS REGULATOR COMPANY

SKOKIE, ILLINOIS | Offices in chief cities in U.S.A., Canada and Mexico

Over 60 years of Automatic Temperature and Humidity Control

When inquiring check CP 2503 opposite last page

Neptune Meters Do Far More than Just Measure!



By eliminating human errors in blending expensive ingredients, this meter paid for itself in one month!

• THEY ARE MODERN PROCESSING INSTRUMENTS
• Here, for instance are a few ways you can save with Neptune:

Speed batch mixing by putting a standard Auto-Stop meter in each liquid ingredient line. Gives you accurate quantity control . . . automatically.

Automatic control of pumps, valves, agitators, etc.: Simply rig Auto-Stop meters with electrical switches which are actuated when desired amount of liquid is delivered.

Eliminate losses due to rejected batches, spills and over-fills. Meters can't make "human" mistakes.

Eliminate unsanitary or hazardous conditions. Liquids stay inside the pipe all the way . . . no muss and fuss of gauge sticks, pails or batch tanks.

Save time, space, and labor costs by handling ingredients as liquids instead of dry solids. Many food plants find big savings in switch from granulated sugar to liquid sugar . . . with Neptune meters the key to accurate measurement.

Accurate inventory and cost control with less effort. All Neptune meters have totalizing counters to record consumption at every step in your process.

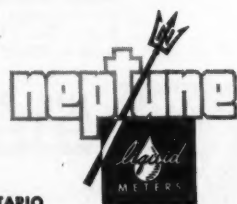
NEPTUNE METERS now handle more than 150 liquid chemicals and food ingredients. Sizes from 25 to 1000 gpm. Bronze construction. Excellent reputation for sustained accuracy and low maintenance. Telephone or write your nearest branch for full details. Ask for Meter Data Book 566-Q P.

NEPTUNE METER COMPANY
19 West 50th Street, New York 20, N. Y.

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ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER
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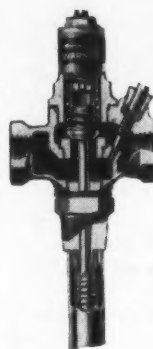
In Canada: NEPTUNE METERS LTD., TORONTO 14, ONTARIO



INSTRUMENTATION

Self-powered controller holds temperatures of cooler water . . .

temperatures are adjustable over range of 50°F



Uses: Controlling temperatures of cooling water for compressors, small engines, water-cooled rolls, small condensers, water-cooled bearings.

Features: Instrument is self-powered and has single-seated valve suitable for use with water containing

scale forming minerals.

Description: Four standard adjustable models cover 60-110°F, 85-135°F, 110-160°F, and 135-185°F. Space between outer thermostat tube and packless bellows seal is filled with fluid giving uniform movement per degree temperature change. Valve head is stainless steel as are valve stem and spring. Valve seat is bronze and valve body is brass. Controls are available for water lines of 3/8, 1/2, 3/4, and 1".

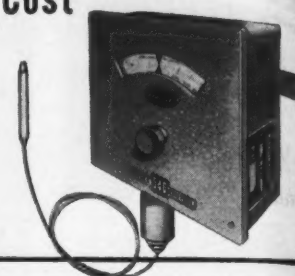
(T-44 cooling controls are product of Sarco Company, Inc., Dept. CP, Empire State Bldg., New York 1, N.Y. . . . or check CP 2505 opposite last page.)

Explains pressure pilot theory of operation

Including diagrammatic sketches of pilot mechanism, 10-page bulletin in three colors explains theory of operation of gage for control pressure indication. Control action can be proportional, off-on, differential.

Bul 110 is issued by Hammel-Dahl Co., Dept. CP, 175 Post Road, (Warwick) Providence 5, R. I. When inquiring specify CP 2506 opposite last page.

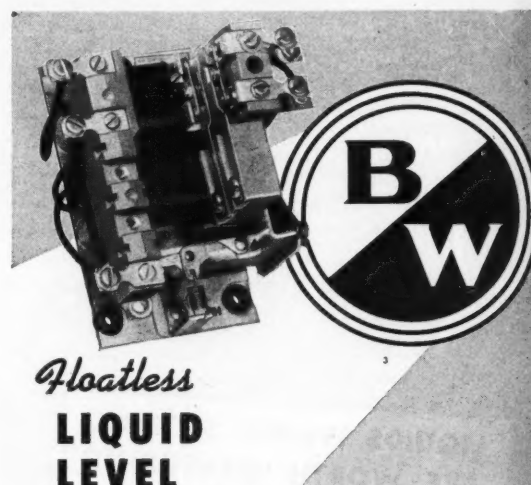
Adjustable Bandwidth Makes This Low Cost Indicator-Controller MORE VERSATILE



This new precision sensing instrument . . . Fenwal Series 540 . . . answers many industrial process control problems. It has a single pole, double-throw relay, with capacity of 15 amps. at 115 Volts. Liquid-filled bulb and capillary principle assures extra-sensitive, accurate response directly to dial indicator. Temperature ranges of 100°F to 700°F and ambient temperature compensation from 50°F to 150°F. In addition to precise on-off control, this unit offers adjustable differential between 1% and 4% of scale range for wide adaptability. Separate terminal connection housings prevent damage and tampering to control mechanism. Reversible slotted brackets. For flush or surface mounting. For FREE data, write for Bulletin MC122 NOW to Fenwal Incorporated, 2412 Pleasant Street, Ashland, Massachusetts.

Fenwal Controls Temperature . . . Precisely

When inquiring check CP 2507 opposite last page



Floatless LIQUID LEVEL and INDUSTRIAL CONTROLS

● Write for latest catalog covering the complete line of B/W Induction Relays, Relay Enclosures, Contactors and Starters, Multiple Pump Controls, Electrode Holders, Starter and Relay Combinations, Special Controls and Panels.

Controls will never trouble you, when you buy B/W

B/W CONTROLLER CORPORATION
2204 East Maple Road, Birmingham, Michigan

When inquiring check CP 2508 opposite last page

CHEMICAL PROCESSING

When inquiring check CP 2504 opposite last page

**Indicates level of corrosives
and non-corrosives
at 200 psi . . .**

squeezes 20-inch dial into panel space of little more than 10 inches



Space-saving gage is self-actuated

Uses: Remote readings of tank contents where instrument panel space is limited.

Features: Instrument has 20" scale although overall size is only 3 by 10 1/4". Available for either horizontal or vertical panel mounting, indicator may be located up to 250 feet from tank unit.

Description: Unit is component of automatic gaging system, consisting of an indicator and tank float, connected by length of flexible conduit containing

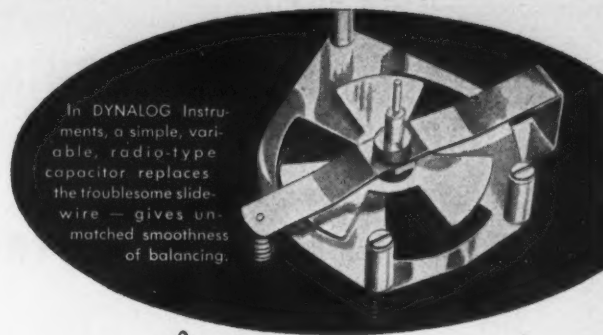
two hydraulic capillary tubes. Gage is actuated by self-contained hydraulic system. It requires no outside power.

(Indicator is product of The Liquidometer Corp., Dept. CP, 41-03 36th St., Long Island City 1, N. Y. . . . or for more information check CP 2509 opposite last page.)



Instruments for every application . . .

can be found in CHEMICAL PROCESSING's section on Instrumentation and Control. The convenient page guide to instruments for your needs is the Product Directory beginning on page 218.



In DYNALOG Instruments, a simple, variable, radio-type capacitor replaces the troublesome slide-wire — gives unmatched smoothness of balancing.

This potentiometer has no slidewire

**STEPLESS
CAPACITY-BALANCING
ELIMINATES
SLIDEWIRE
MAINTENANCE**

There's no need to put up with worn slide-wires and sticking electrical contacts . . . no need to periodically clean and lubricate balancing motors. DYNALOG design eliminates all this! Its simple variable capacitor and positive magnetic drive provide *continuous, stepless* balancing . . . *never* require attention!

DYNALOG's friction-free action provides high speed of response without wear. (There are only five moving parts, including the

*Reg. U.S. Pat. Off.

recording pen!) Sensitivity, unlimited by turns of slidewire winding, is 1/100 of 1%. And accuracy is a sustained 1/4 of 1%.

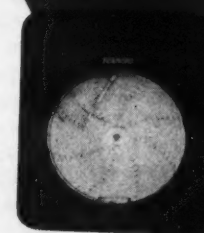
DYNALOG Instruments are available for use with resistance, voltage, capacity, or inductive type primary elements to measure and/or control any process variable . . . with unmatched smoothness. Write for Bulletin 427. The Foxboro Company, 8112 Neponset Ave., Foxboro, Mass., U.S.A.

FOXBORO
*Reg. U.S. Pat. Off.
DYNALOG

ELECTRONIC  INSTRUMENTS

**DYNALOG'S*
EXCLUSIVE
BALANCING
ACTION**

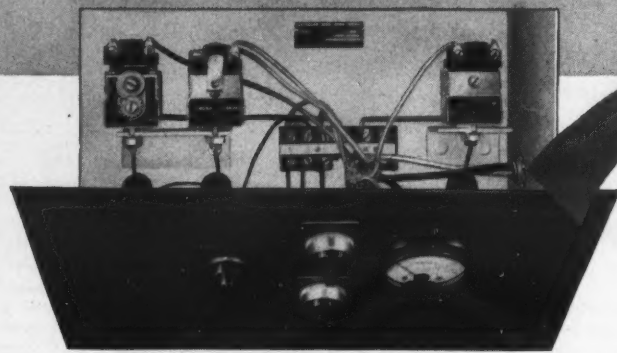
- no slidewire
- no batteries
- no standardizing
- no gears, cables, etc.
- no high-speed reversing motor



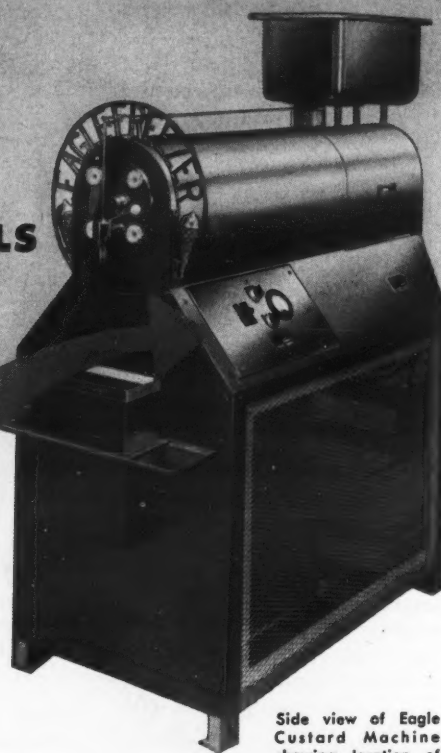
When inquiring check CP 2510 opposite last page

EAGLE CUSTARD MACHINE

factory equipped with
**ALLEN-BRADLEY
AUTOMATIC MOTOR CONTROLS**



Close-up of Allen-Bradley control panel with knob controls. At left is setting knob for thermostat control. In center, upper knob controls beater motor; the lower knob controls the compressor motor.



Side view of Eagle Custard Machine showing location of Allen-Bradley panel.

Allen-Bradley Quality Controls assure trouble free performance without contact maintenance

The Eagle Machine & Tool Co. solved their problem of providing accurate and reliable controls for their custard machines by using a special control panel supplied by Allen-Bradley.

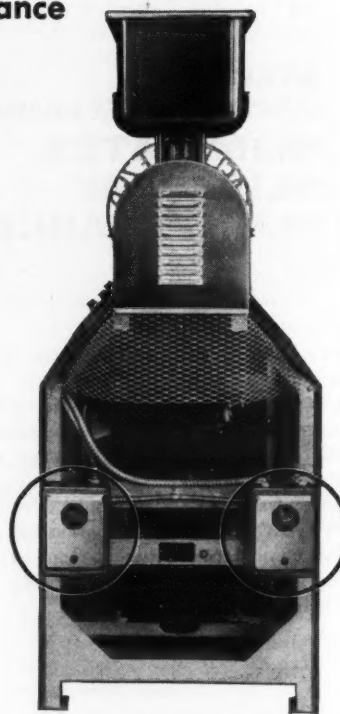
Since temperature and pressure must be accurately regulated in custard production, Allen-Bradley Bulletin 836 high and low pressure automatic pressure switches are mounted on the control panel. For critical temperature control, an Allen-Bradley Bulletin 837 temperature switch with a manual adjusting knob is used.

These three controls automatically open and close the two Allen-Bradley solenoid motor starters that are mounted on the back of the custard machine.

When you have a motor control problem, call in your nearest Allen-Bradley sales engineer. Let him study your requirements for either manual or automatic control. He is at your service. Remember . . . the Allen-Bradley trademark is a sales asset to any motorized machine. It is the sign of QUALITY motor control.

Allen-Bradley Co., 104 W. Greenfield Ave., Milwaukee 4, Wis.

In Canada—Allen-Bradley Canada Ltd., Galt, Ont.



Rear view of the custard machine, showing the Allen-Bradley Bulletin 709 automatic starters for the beater and compressor motors.

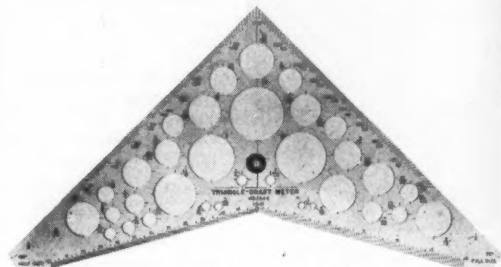
INSTRUMENTATION & CONTROL

30-60 and 45 triangles combined with protractor, scale, guide and circle templates

Single drawing instrument combines functions of —

- ten-inch 45° triangle
- combined 30-60° angles
- ten-inch graduated protractor
- scale in 32nds and 16ths
- lettering guide
- circle template (33 circles range from 3/32 to 1 1/2")

Drawing tool is made of acrylic vinyl copolymer 0.075 inches thick. Rigid and transparent, this plastic



Drawing tool is about 14 inches from tip-to-tip

is shatterproof. Circle templates are bevelled at 15° permitting close pencil tolerance. Lifting knob at center provides for easy manipulation.

(Triangle-Draft Meter is a product of Alvin & Co., Dept. CP, Windsor, Conn. . . . or for more information reader may simply check CP 2512 on form which is located opposite last page.)

Indicates fluid flow at 1200 psi . . .

sleeve magnetic-follower on outside of tube follows float motion and indicates flow rate

Uses: Metering fluids at high pressures, to 1200 psi at 200°F. Also suitable for opaque fluids.

Features: Magnetic follower is used for float indication of fluid passing through rotameter. All glass parts are eliminated.

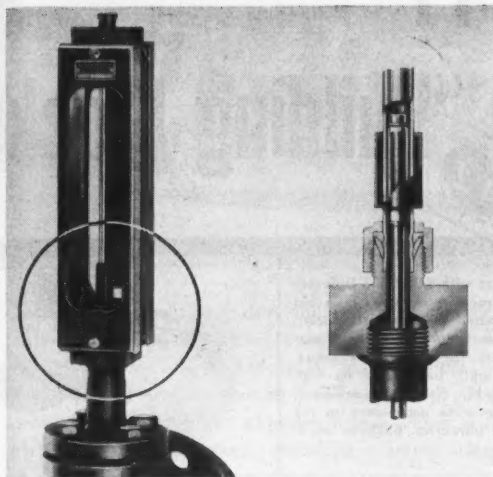
Description: Indicator is bolted to any of manufacturer's metal rotameters. Rotameter float has extension tube which contains a special enclosure with a permanent magnet. As float moves up and down in the rotameter tube, magnet moves also. A sleeve magnetic follower on the outside of the indicator tube follows the float motion and indicates flow rate.

Indicator tube is satin-chrome plated and follower



The Sign of
QUALITY
MOTOR CONTROL

When inquiring check CP 2511 opposite last page



Has metal-to-metal seal for pressures to 1200 psi

is designed for minimum friction. End fittings are provided with Swagelok fittings, giving positive metal-to-metal seal. Stainless steel is used for extension tube and fittings. Other alloys can be specified.

(Mag/Na/Vue is product of Brooks Rotameter Company, Dept. CP, 47 Dennison Ave., Lansdale, Pa. . . . or for more information check CP 2513 on form opposite last page.)

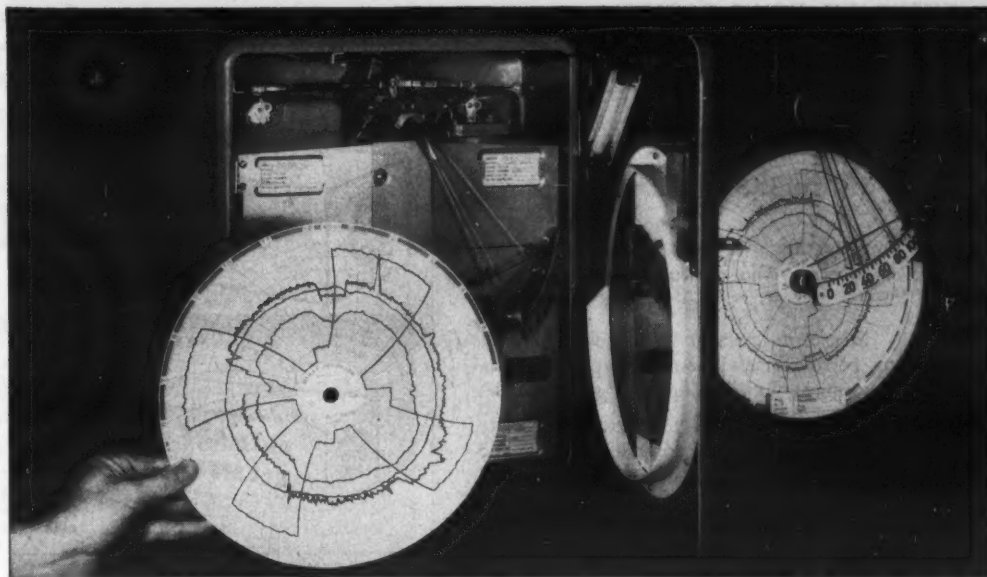
Discusses manufacturer's line of proportional controllers

Bulletin describes company's complete line of electric proportional controllers. Instruments are used for control of dew point, pressure, temperature — in batch process, combustion atmosphere and heat-treating furnace applications. Instruments described consist of an electric control unit, measuring element, and an indicating or recording mechanism.

Functions of three methods of electric control are explained. These are proportional plus manual reset, proportional plus automatic reset, and proportional-set average-position.

Bul 4-11 is issued by The Foxboro Co., Dept. CP, 86 Neponset Ave., Foxboro, Mass. When inquiring specify CP 2514 on form opposite last page.

Find viscosity of soda ash solutions easily
with the nomograph on page 204



Faithfully yours -

Clear, Continuous Records without Poisoning . . . on the New Bailey Recorder

★ Faithful chart records of measured variables are the key to a meaningful, dependable analysis of operating trends and conditions. Money spent for more accurate metering, for faster response, is money down the drain—*unless* it's matched with chart records that are equally accurate.

That's why these features of the new Bailey Recorder are important to you:

1. Bailey's exclusive sealed capillary-action inking system maintains continuous flow to the pen tip, and traces sharp, opaque, quick-drying records. "Poisoning" of intersecting records is practically eliminated; no blots or smears during operation or chart changing.
2. Pens are mounted on concentric centers, trace on parallel time arcs only 42/1000" apart. This simplifies analysis of two or more records.
3. Interchangeable plug-in receiver units permit practically limitless record-grouping combinations.

Write for Product Specification E12-5 and actual chart sample.

P25-1



ONLY BAILEY OFFERS ALL THESE ADVANTAGES IN A SINGLE RECORDER

- Pre-calibrated plug-in receiver units
- Up to four pneumatic or electronic receivers — or two receivers and two integrators
- Any four variables on one chart—easily read and interpreted
- A full year's ink supply at one loading
- Faster shipment—from stock
- Minimum inventory of parts
- Minimum instrument investment for process cycle expansion or alteration

BAILEY

METER COMPANY

1074 IVANHOE ROAD

Controls for Power and Process



Controls for
TEMPERATURE
PRESSURE
GAS ANALYSIS
FLOW LEVEL
RATIO DENSITY

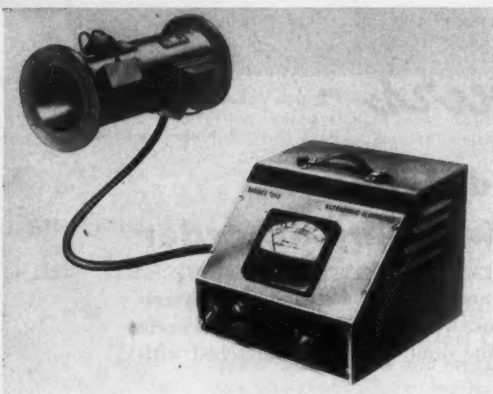
When inquiring check CP 2515 opposite last page

Find mass or volume rate using ultrasonics

Flowmeter has 1% linearity and better than 2% accuracy; no obstruction to flow

Uses: Measuring mass or volume flow of fluids including petroleum and petroleum products, water and aqueous solutions, liquefied gases, slurries.

Features: Variations due to pressure, viscosity, gas bubbles, solids in suspension, electrical conductivity or position of installation are eliminated. Flowmeter has no moving parts or restrictions to obstruct flow.

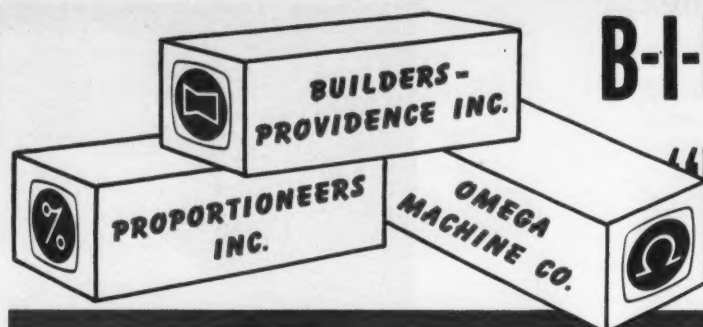


Mass flow, or lb/unit time, is measured with three transducers

Description: Flowmeter is built into a short section of pipe. Two transducers, each of which transmits and receives controlled impulses of sonic energy across the pipe section, measure volume flow. Difference in number of pulses received by each transducer indicates flow rate. Increasing flow rate increases number of downstream pulses and decreases number of upstream pulses. Decreasing flow rate will result in the opposite effect.

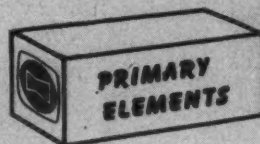
In order to achieve this type of measurement, design employs a pulse generator (blocking oscillator), and amplifier. Pulses are driven both ways across pipe — from A to B and from B to A. Referring to diagram, a pulse headed downstream (from A to B) is aided by flow of material through the pipe. Thus its effective path is shorter than the true path from A to B. Conversely, pulse traveling from B to A must buck the flow and has an effective path longer than distance AB.

For pulses headed in either direction, pulse generator is triggered by amplified signal generated when previous pulse was picked up by receiving transducer. Thus entire loop of pulse generator, amplifier and pulse path from "broadcasting" to

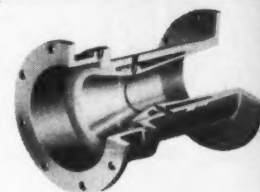


B-I-F

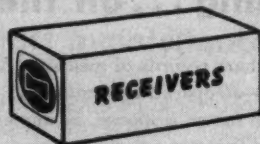
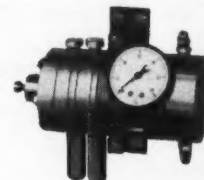
"Building Blocks"



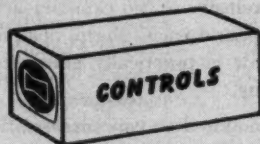
By metering flows of liquids and gases with BUILDERS Differential-Type Primary Metering Elements, process companies gain big savings in pumping costs and maintained metering accuracies. The BUILDERS-PROVIDENCE line includes the widest range of cast steel and insert type Venturi Tubes, and fabricated Flow Tubes. The new Doll Flow Tube (shown at right), because of its high pressure recovery characteristics, its stable discharge coefficient, and its self-scouring design, is gaining wide acceptance in the process, petroleum, and petro-chemical industries. Bulletins available on request.



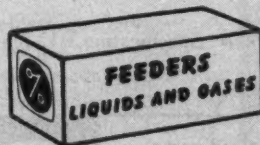
Efficient metering of flows, liquid levels, pressures, temperatures, or weight requires accurate data transmission. BUILDERS Chronoflo (electric) and Balance (pneumatic) Transmitters send plant operating data from remote locations to central control panels. The extensive BUILDERS line of process "building blocks" makes it possible for us to recommend the one best transmission system for each individual operating problem. Write for bulletins.



Registration of process data is handled accurately and efficiently by BUILDERS-PROVIDENCE Receiving Instruments and Control Panels. The complete line of equipment includes mechanical, electrical, and pneumatic units for all combinations of totalizing, indicating, and/or recording flow, level, pressure, temperature or weight. Instruments give straight-line readings with equal graduations over the complete operating range. Panels may incorporate standard or miniature instrumentation, as required. Send for complete information.



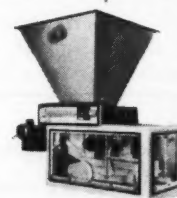
BUILDERS pneumatic and electrical systems convert metering signals into control impulses for providing remote advisory data ... for controlling pumps, valves, compressors, circuit breakers, etc. ... for pacing chemical feeders and proportioning equipment. B-I-F continuous process systems are based on fundamental metering and controlling methods proven in hundreds and hundreds of actual process applications. Component "building blocks" add up to stable, accurate, and highly dependable process systems. May we assist you?



PROPORTIONEERS Chemical Proportioning Pumps — OMEGA Liquid Loss-in-Weight Feeders and Rotodip Gravity Liquid Feeders — and BUILDERS Chlorine and Ammonia Feeders all embody simple feed rate adjustments easily adapted to automatic control systems. Dosage control may employ the start-stop method or the automatic-proportional system as demanded by process conditions. B-I-F Industries offers special materials of construction for feeding acids, alkalis, and other "difficult" liquids. Check with us today.



OMEGA Feeders provide controlled feeding of all types of solids at rates from a few ounces to a ton a minute. Stock units are available for feeding every type of material from floodable finely pulverized powder to granular and 1" lump sizes. BUILDERS Conveyaflo — "the flow meter for dry materials" — also available as a high-capacity feeder for conveyORIZED flows. Send a sample of the material you want to feed for engineering study.



cks" for Continuous Processing

Here's important news for you! The big economies of automation-type continuous processing are attainable through the use of B-I-F Industries "building blocks" . . . adaptable to literally thousands of industrial production problems. Here you can obtain a simple unit or a completely integrated system, including primary metering

elements, instrumentation and controls, and secondary feeding and proportioning equipment — supplied by the combined forces of BUILDERS-PROVIDENCE, INC., PROPORTIONEERS, INC., and OMEGA MACHINE COMPANY. We take full responsibility for the equipment we supply — from start-up to guarantee of performance.

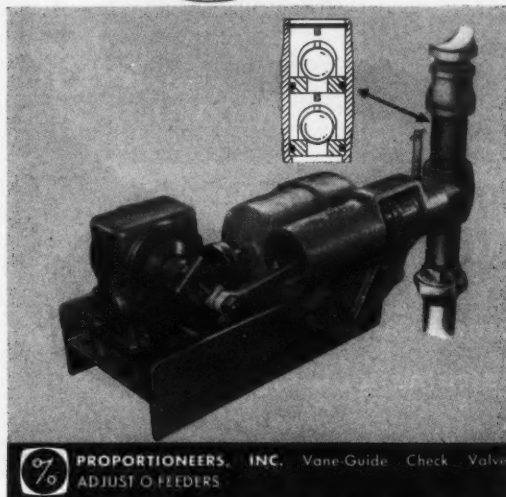
Two new "building blocks" in the B-I-F Line...



OMEGA MACHINE COMPANY continuous liquid or solid loss-in-weight FEEDERS

- **UNLIMITED APPLICATIONS** — feed by weight all types of solids (powders, coarse particles, cut vegetables, etc.) and liquids (clear, suspensions, pulps, etc.). Also adaptable to stream weighing.
- **HIGHEST ACCURACY** — within $\pm 1/2\%$ by weight of set feed rate over entire range.
- **BUILT-IN MEMORY** — dead weight system automatically totalizes and corrects shortages or overages.
- **A MODEL FOR EVERY USE** — Simplex and Duplex for feed rates from 1 to 60,000 #/hr. Available with remote controls (electrical, pneumatic).

For complete information on these automation tools for continuous processing, write OMEGA MACHINE COMPANY (Division of B-I-F Industries).



PROPORTIONEERS, INC. Vane-Guide Check Valve ADJUST O FEEDERS

- **EXCEPTIONAL FEEDING ACCURACY** — with Proportioneers NEW Vane-Guide check valves and minimum clearance volume cylinders . . . self-purging with straight-through design.
- **EASY-SERVICE DESIGN** — plug-in reagent end . . . other mechanical components all readily accessible and of standard design . . . reversible check valve seats.
- **POSITIVE FEED RATE SETTING** — micrometer stroke length adjustment on all standard models . . . available with in-motion rate adjustment.
- **COMPACT DESIGN** — easily installed . . . saves floor space.
- **NEW LOW COST** — check our quote on any feed rate from 0.8 GPH to 900 GPH!

Send data on your process problem to PROPORTIONEERS, INC. (Division of B-I-F Industries) for prompt analysis and recommendations . . . or ask for the name of our nearby representative.

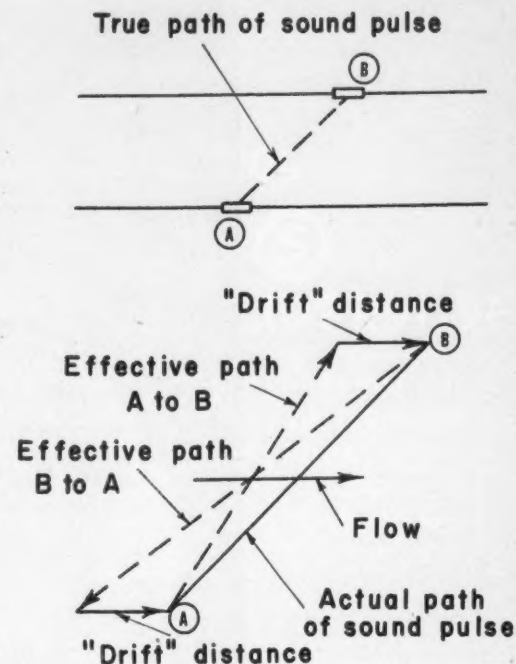


B-I-F INDUSTRIES

PROVIDENCE, RHODE ISLAND
BUILDERS IRON FOUNDRY • PROPORTIONEERS, INC. METERS
BUILDERS-PROVIDENCE, INC. • OMEGA MACHINE CO. FEEDERS
CONTROLS

When inquiring check CP 2516 opposite last page

INSTRUMENTATION & CONTROL



"receiving" transducer acts as a feedback loop. Gain of amplifier is sufficient to cause it to oscillate freely. But frequency of this oscillation is a function of delay time incurred from A to B (or B to A). Since this delay time depends on direction and magnitude of flow, flowrate can be read as a function of frequency.

Automatic gain control prevents triggering the ultrasonic transmitter by small or reflected noise, permitting flow measurement of slurries.

Third transducer may be added to the volumetric flow-rate meter for density measurements and conversion of instrument into mass flowmeter. Variations in density can thus be compensated. Same pipe can then be used for different materials with accurate control. Conventional voltage indicators may be used for either volume-flow or mass-flow output signal.

Totalization of mass transferred may be handled by integration of gravimetric rate signal, using built-in analog computer.

Present designs have capacity up to 12,000 lb/min with a fluid density range of approximately 2.5 to 1. Instrument can be adapted to any standard pipe size down to 2". Temperature limits are minus 50° to 225°F although with special provisions limit can be raised to 750°F. Pressure limit is 150 and 300 psi.

Linearity is within 1% full scale and accuracy is better than 2% full scale.

(Ultrasonic flowmeter is product of Fischer & Porter Company, Dept. CP, 48 Jacksonville Road, Hatboro, Pa. Check CP 2517 opposite last page.)



new controlled volume pump



Milton Roy Motor-Driven Pump with Instrument Air Stroke Length Adjustment. Control cabinet (front) houses components of the stroke-adjusting servo system. Remote capacity control by two process variables is possible when variable speed motor driver is used with pump.

BE SURE TO SEE IT

at the Milton Roy exhibit, "25th Exposition of the Chemical Industries," Dec. 5-9, Convention Hall, Philadelphia, Booth 313.

now automatic stroke length adjustment
by instrument air signal

DESIGN FEATURES

Instrument air 3-15 psi
Main supply air 80 psi
Air consumption:
Motor running full speed . . 15 cfm
Motor not running . . . 0.3-0.4 cfm
Motor revolutions per inch
change of pump stroke . . . 240
Air consumption per inch
change of pump stroke . . 2.5 cu. ft.
Stroke positioning
speed 10 sec./in.
Positioning
accuracy better than 1%
Sensitivity 1/70 psi change
in instrument
air signal

HERE is precision controlled volume pumping with a *plus*: automatic capacity control by standard 3 to 15 psi instrument air signal. Plunger stroke length is infinitely adjustable from zero to 100% of maximum by an air-operated servo system that is accurate to within 1%. A change in instrument air signal as small as 1/70 psi repositions the plunger stroke length setting.

new bulletin 955 gives full details. Send for your copy today . . . to Milton Roy Company, Manufacturing Engineers, 1300 E. Mermaid Lane, Phila. 18, Pa.

Heart of this new motor-driven pump is a small, powerful rotary air motor coupled to the stroke-changing mechanism. Air volume boosters in the air motor lines give fast, positive positioning. An extremely stable feedback circuit gives high positioning accuracy. Air consumption, when the system is in balance, is low — only 0.3 to 0.4 cfm.

milton Roy
CONTROLLED VOLUME PUMPS

Engineering representatives in the United States, Canada, Mexico, Europe, Asia, South America, and Africa.

When inquiring check CP 2518 opposite last page

INSTRUMENTATION & CONTROL

Provides data and description of nutating disc meters

Profusely illustrated, 20-page, two-color bulletin describes nutating disc meters for chemicals, cold water, gasoline, hot water, molasses, and many other materials. Some accessories are also described.

Complete specifications and sizes are tabulated for each type of meter. One particularly helpful feature is a nomograph which allows pressure drop to be estimated as a function of flow rate for any size meter.

Bul 36 is issued by Buffalo Meter Co., Dept. CP, 2917 Main St., Buffalo 14, N. Y. When inquiring specify CP 2519 on form which is located opposite last page.

Spring-driven shutter eliminates lights in strobe . . .

two ranges cover 500-8000 rpm and 1000-16,000 rpm



Visual tachometer is slightly larger than a baseball

Uses: Can be used to find rotary or vibratory speeds from distances of 3 to 50 feet from equipment.

Features: Stroboscopic principle is used — a spring-wound mechanism stops motion. Speed reading is taken on calibrated dial of instrument.

Description: Spring mechanism of tachometer is wound. Operator looks through tachometer, focuses on object in question and synchronizes speeds by rotating narrow rings. When motion of equip-

INSTRUMENTATION & CONTROL

ment has been stopped, operator reads speed scales shown running around the tachometer.

Two basic speed ranges — 500 to 8000 and 1000 to 16,000 rpm or strokes per minute — are incorporated. Accuracy is 2% any place above first 15% of either scale.

Slightly larger than a baseball, instrument weighs only 11 ounces.

(Visutac is a development of Boulin Instrument Corp., Dept. CP, 65 Madison Ave., New York, N. Y. . . . or for more information check CP 2520 on form opposite last page.)

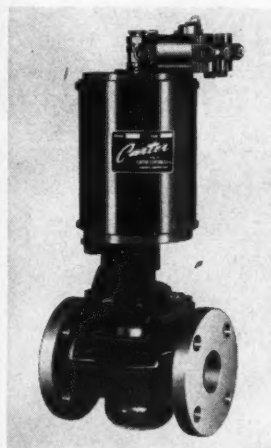
Gives rotary movement for remote control of valves . . .

rotary actuators can be operated with air, gas or hydraulic pressures

Uses: Remote-controlling lubricated plug valves.

Features: Rotary actuator can be designed to produce degree of rotary movement from 0° to 360° by increasing overall length of helix piston rod assembly.

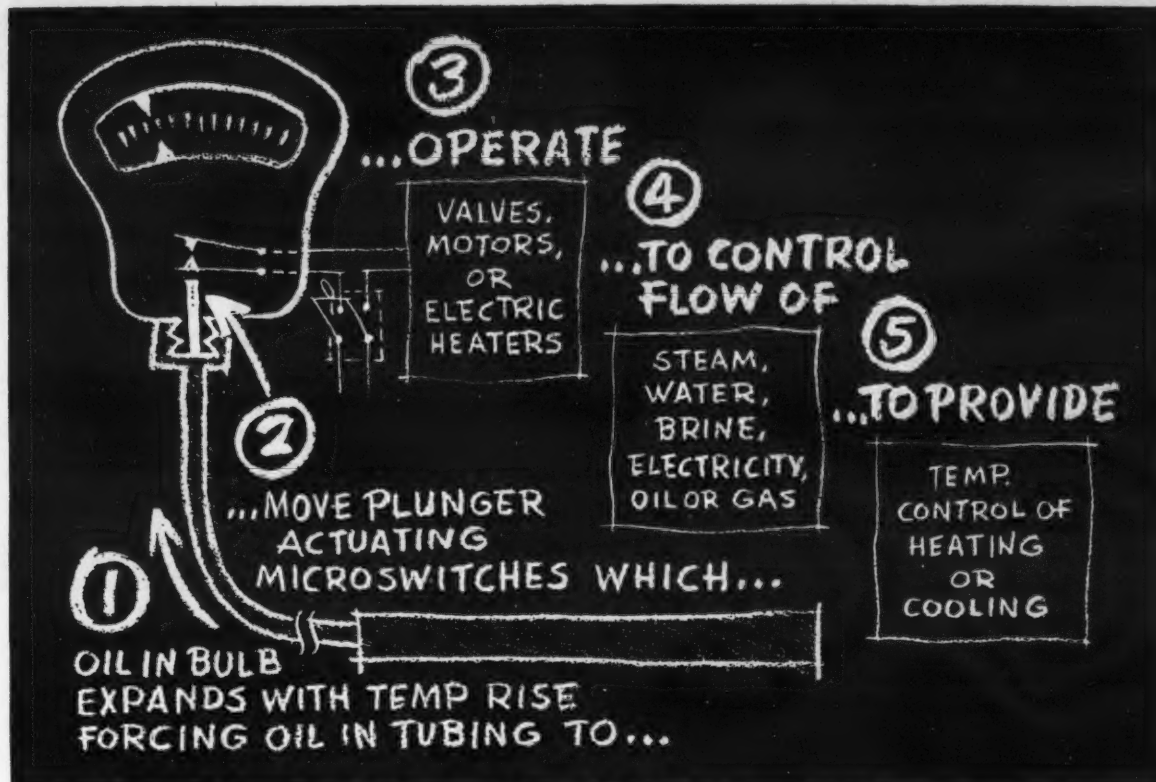
Description: Unit has an internal helix arrangement which converts in-line motion of a hydraulic or pneumatic cylinder into rotary movement. Actuator can be operated with air, gas or hydraulic pressure. By use of switching, actuator can be made to stop at any rotation point. Varied rotary sequences can be obtained through using a slip clutch in the unit. Complete rotation can be obtained by a series of partial rotation cycles.



Plug valve can be lubricated through center of actuator

Five standard models provide 350, 700, 1200, 1820 and 3360 in-lb of torque at 100 psi. Bore is three to eight inches respectively. Units are enclosed. Mounting brackets for many makes of valves are available. Plug valves can be lubricated through center of actuator, using hollow piston rod.

(Actuator is product of Carter Controls, Inc., Dept. CP, 2800 Bernice Road, Lansing, Illinois . . . or for more information check CP 2521 on form opposite last page.)



INDICATING Automatic Temperature Control

It's simple...dependable!

That rough sketch above tells the story. It shows Sarco's simple electric indicating temperature control . . . and what it can do for you.

Really mighty simple, isn't it? Yet, it's adjustable, indicating and provides dependable accuracy to $\pm \frac{1}{2}^{\circ}\text{F}$. No gadgets that call for a technician to read and repair! So simple, so trouble-free . . . maintenance is seldom, if ever, needed.

Turn one knob to change the temperature control setting. Large, easy-to-read scale shows you both the actual and the set temperature.

SEQUENCE CONTROL

And this Sarco electric temperature control is versatile . . . it offers you many sequence combinations such as:

- Step-heating
- Heating and cooling
- Wide limit control
- Temperature control plus operation of signal devices

Cost . . . only about \$100! It's good economy to specify AUTOMATIC temperature control for ALL control jobs, not just the big ones. So mail the coupon now for complete information.

SARCO

Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.

Please send information on your simple, inexpensive temperature controllers:

☐ Self-powered type for use on _____

☐ Electric indicating type for use on _____

Name _____

Firm _____

Address _____

City _____ State _____

2147-B

When inquiring check CP 2522 opposite last page

DEKORON
Poly-Cor

harness

Now you can whip high instrument tubing installation and replacement costs in your plant—with Dekoron Poly-Cor®. That's because the chemical resistance of plastic even outlasts expensive alloy tubing... because its lighter weight and flexibility make it a snap to install without special tools... because you can install practically any number of tubes at one handling, just like electric wiring. You can't lose with Dekoron Poly-Cor — it cuts your investment because of its lower installed cost, cuts your maintenance because it lasts years longer.

Tube up with DEKORON completely

Dekoron products now include single and multiple line metal tubing with plastic coating, multiple tube all-plastic instrument line harness (above), flat 10-tube "ribbon," fittings and junction boxes.

Dekoron products

QUALITY • RESEARCH • SERVICE

SAMUEL MOORE & COMPANY
DEKORON PRODUCTS DIVISION • MANTUA, OHIO

When inquiring check CP 2523 opposite last page

INSTRUMENTATION & CONTROL

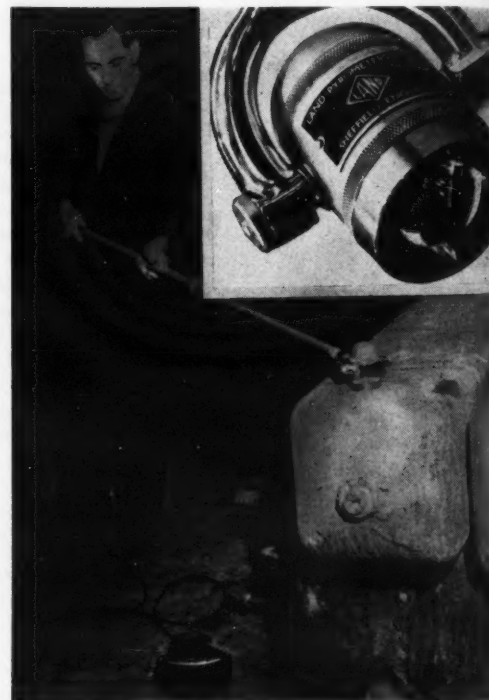
All about thermistors — specs, descriptions

Sixteen-page publication contains complete vital information about all types of thermistors. Its organization is somewhat similar to an electron tube manual — it can be used the same way for design purposes. Hundreds of thermistors are listed with description, basis resistance, dissipation constant, time constant and dimensions.

Thermistor catalog is issued by Victory Engineering Corp., Dept. CP, Springfield Road, Union, N. J. When inquiring specify CP 2524 on form which is located opposite last page.

"Spot check" temperatures with accuracy of 0.5% to 2400°F...

portable pyrometer measures high temperatures though surrounded by cooler air

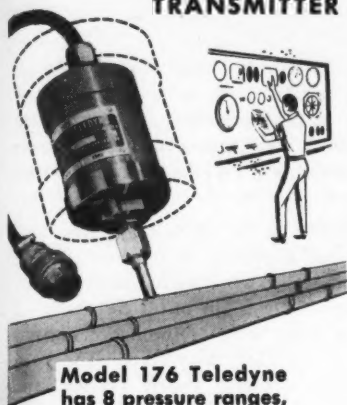
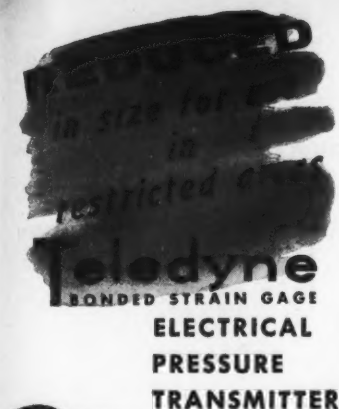


Insert shows measuring head

Uses: Measuring "spot" temperatures, ranging from 100 to 2400°F, of oxidized steel or cast iron, oxidized non-ferrous metals, painted surfaces.

Features: Instrument will give accurate temperature readings within 0.5% regardless of temperature of surrounding air.

CHEMICAL PROCESSING



Especially designed for use in applications where space is at a premium, the new Model 176 has all the major features of the larger Model 158 Teledyne with the added ability to withstand overload up to 100%. Only 2 1/4" in diameter and 3 1/2" long, it is one of the most advanced pieces of equipment of its kind available. It measures, and transmits pressures of gases and fluids to indicating and recording instruments and has a host of exclusive features found nowhere else. Bonded strain gage construction (insensitive to vibration and shock), stainless steel pressure chamber, high frequency response, linear output over full pressure range, temperature compensated for zero shift and sensitivity change. Easily disassembled for clean-out and repairs.

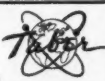
PLEASE NOTE: Contact us for calibration service on Pressure Transducers. 0 to 25,000 P.S.I.

Write for Illustrated Literature

TABER INSTRUMENT CORPORATION

SECTION 46

111 Goundry St., N. Tonawanda, N. Y.



Description: Measuring head is mounted on telescopic arm which can be extended to length of nine feet. Measuring head is connected by trailing lead to portable mv meter calibrated in degrees F. Instrument requires no external power supply and readings can be obtained from pyrometer five seconds after head is placed upon the hot body.



Radiation is sampled through fluorite window

Instrument head is concave in shape and closes off a portion of heated material, forming a uniform temperature enclosure. "Black body" radiation trapped in enclosure is then sampled through a small fluorite window, transparent to most of the infrared spectrum. Temperature is measured by thermopile.

(Land Surface Pyrometer is a product of Fielden Instrument Div., Robertshaw-Fulton Controls Co., Dept. CP, 2920 N. Fourth St., Philadelphia 33, Pa. . . . or check CP 2526 opposite last page.)

Electronic parts catalog of 256 pages

Book of 256 pages catalogs electronic parts for maintenance and repair. Short descriptions, including prices, are given on each item.

Catalog 62 is issued by Newark Electric Co., Dept. CP, 223 W. Madison St., Chicago 6, Ill. When inquiring specify CP 2527 opposite last page.



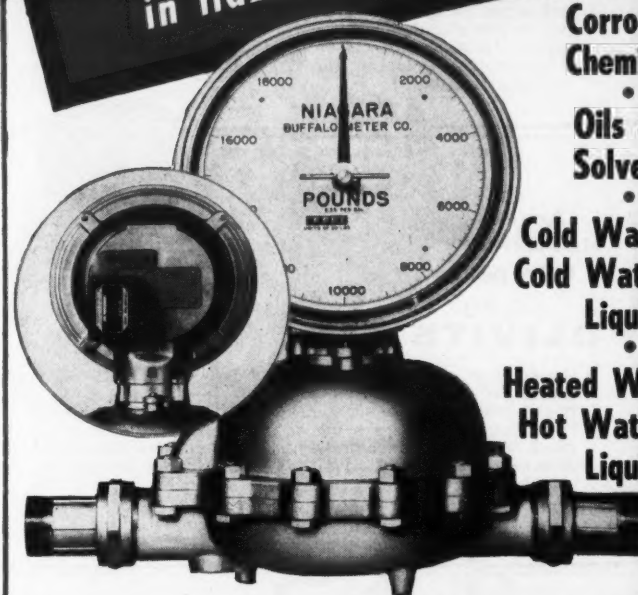
Golt.

When inquiring check CP 2525 opposite last page

DECEMBER, 1955

Now -Explosion Proof! A New NIAGARA Electriccontact Meter

for Automatically Measuring
and Controlling Liquids
in Hazardous Atmospheres



Corrosive
Chemicals

Oils and
Solvents

Cold Water and
Cold Water Base
Liquids

Heated Water and
Hot Water Base
Liquids

For CHEMICAL PROCESSING PLANTS

Shuts solenoid valve or stops pump motor after preset gallonage has flowed through the meter. Opens or closes circuit to actuate any electrical controls. Provides automatic shut-off for batch measurements. Insures accuracy. Saves time. Increases production without increasing man-power requirements. Wide range of sizes and capacities of both Meters and Electriccontact Registers.

Design incorporates Model EX-AR Microswitch which carries Underwriter's Laboratories listing for use in hazardous atmospheres, Class 1, Group C and D and Class 2, Group F and G. Electriccontact register has new improved heavy duty construction. Used on 110 to 550 V. a.c.

Brings automation to liquid volume measurement and control even in hazardous atmospheres.

For Complete Details
Write for Bulletin 35

**BUFFALO
METER CO.**

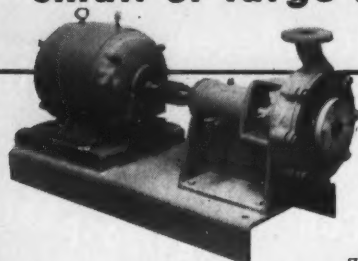
2892 MAIN STREET
BUFFALO, N. Y.

Representatives in all leading industrial centers

See us — Booth 442 — The Chemical Show, Philadelphia

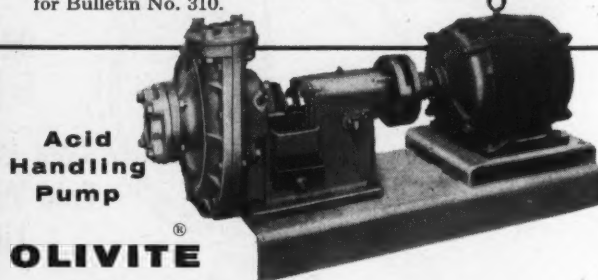
When inquiring check CP 2528 opposite last page

for highest operating efficiencies in handling small or large flows —



**OLIVER
TYPE L
Centrifugal
Pump**

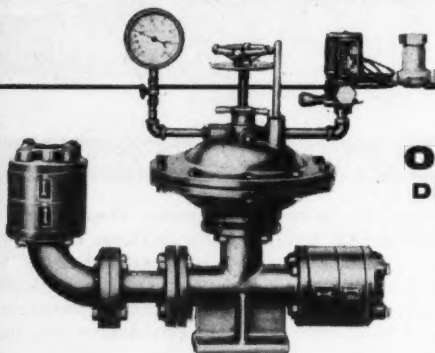
The Type L is a corrosion resistant chemical pump featuring a high cut-water or tongue of the volute. This makes the pump self venting . . . improves priming. Available in four standard sizes — 1", 1½", 1¾" and 2". Contact parts are made of Alloy 20 or Type 316 stainless steel, bronze or cast iron. 1" model in Alloy 20 stainless steel only. Write for Bulletin No. 310.



**Acid
Handling
Pump**

OLIVITE

An efficient, durable pump for handling hot or cold corrosive solutions. Special rubber or neoprene base composition lines casing, cover and impeller. It does not crack or slough off even under high temperatures. Sizes available — 1½", 2" and 4". Write for Bulletin No. 308-R2.



**OLIVER
Diaphragm
Slurry
Pump**

This pump is designed to operate without mechanical linkage for transmitting force to diaphragm — source of power is compressed air. There is no motor, stuffing box or packing. Capacity quickly changed from zero on up without stopping operations. Pump is ideally suited for handling slurries containing fragile crystals or floc. Six sizes available. Write for Bulletin No. 309-R.

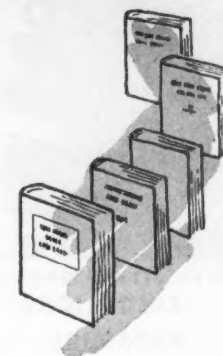
Dorr-Oliver engineers, specialists in pump applications, will gladly discuss your pumping problems. Write for their assistance.



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When inquiring check CP 2529 opposite last page

Recent Books



The Chemistry of Synthetic Dyes and Pigments

Reviewed by JAMES OGILVIE

Supervisor, Dye Research

Allied Chemical & Dye Corporation

This monograph edited by H. A. Lubs, which is one of a series sponsored by the American Chemical Society, is intended to serve two principal purposes: first to make available to chemists a thorough treatment of the subject in form usable by persons working in unrelated fields, and second to stimulate further research.

Prior to World War II, the practices of dyestuff manufacturers were, for the most part, closely guarded secrets. After the Allied occupation of Germany, various governmental missions collected and published for general information the processes developed by the German dyestuffs industry and the availability of this vast amount of information was, according to the editor, an important factor in facilitating the preparation of this book.

It contains a wealth of information on benzene and naphthalene intermediates, azo, azoic, sulfur, anthraquinone, indigoid, phthalocyanine and miscellaneous dyes and organic pigments. It discusses the relationship of color and constitution and contains a very useful critical bibliography. In this reviewer's opinion, the use of electronic concepts and the discussion of unit processes under the independent headings of benzene, naphthalene and anthraquinone is praiseworthy. In this respect it is the best treatment of this subject published to date. The sections on pigments are very comprehensive and informative.

The promotion of the manufacture of dyestuffs requires a great deal of highly specialized "know-how" and a really informative work on their modern technology re-

mains to be published. It is to be hoped that the nineteen very experienced contributors to this book will feel inclined to fill this great need.

Those skilled in the art will find this book very useful. However, no mention is made of outstanding discoveries not hitherto published and there is no broad discussion of the lines along which future developments should or are likely to proceed. The book is logically arranged, clearly printed, and the style is very readable, but one would occasionally expect a more critical treatment of this very dynamic subject such, for example, as a more explicit comparison of the merits of the methods given for the preparation of pyranthrone from methylanthraquinone and from pyrene, or a more categorical statement by the inventor-contributor of the fastness of anthraquinone oxadiazine vat dyes.

To obtain "The Chemistry of Synthetic Dyes and Pigments" remit \$18.50 direct to Reinhold Publishing Corp., Dept. CP, 430 Park Ave., New York 22, N. Y.

Organic Syntheses Collective Volume III

Reviewed by ROBERT C. KRUG

Associate Professor of Chemistry

Virginia Polytechnic Institute

"Organic Syntheses Collective Volume III" edited by E. C. Horning is a revised edition of annual volumes 20-29 of this famous series, is a companion volume to the first and second collective works, and has the obvious advantage of bringing many syntheses under one cover.

Changes were made in some of the preparations and several new procedures were intro-

reviews of current technical and reference works
... summarized for you by authorities in the field
working with the CP staff

duced. The syntheses are arranged alphabetically, and two or three different methods of preparation of the same compound may be found in some cases, e.g., tertiary-butyl acetate, β -naphthaldehyde and others. Those syntheses with an asterisk above the title deal with the preparation of compounds now commercially available; however, the only key to the meaning of the asterisk is given in the preface and referred to on page one. Such a notation could have been more prominently displayed, perhaps in the indices. One helpful change is the use of D-arabinose for the formerly employed d-arabinose.

A laboratory ozonizer is described; however, the write-up does not mention the commercial, laboratory scale ozonizer now available (Welsbach Corp.). The preparation of sodium amine is given, although it could have been omitted since a similar procedure appears in "Inorganic Syntheses Volume II" and sodium amine is commercially available.

The book has a solvent and reagent index in addition to the usual illustration, formula, compound, reaction and general indices.

To obtain "Organic Syntheses Collective Volume III" remit \$15 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N. Y. When inquiring specify CP 2530 on form opposite last page.

Conversion Factors and Tables

(Staff Review)

Although there generally isn't a great deal to say about a new book of conversion factors and tables, this little volume might be of real value to someone who would have occasion to convert *ardebs* into *kadaks* (Egyptian) or maybe *funts* to *luts* (Polish).

Besides foreign conversions, the compilers of this pocket-sized edition have included such diversified information as: color scale

conversions for liquids, foreign monetary equivalents, hardness conversion factors, and five place logarithms.

In 525 pages, this 1955 edition lists over 12,000 conversion factors and contains 122 pages of conversion tables.

To obtain "Conversion Factors and Tables" remit \$5.00 direct to Industrial Research Service, Inc., Masonic Bldg., Dover, N. H. Specify CP 2531 opposite last page.

Polarographic Techniques

Reviewed by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Dr. Louis Meites, a generous contributor to the literature of polarography, has given us a 317-page treatise, which, though not exhaustive, is nicely suited to the needs of chemists in analytical, clinical, industrial, and biochemical laboratories. In nine chapters that deal competently with the nature and scope of polarographic measurements, instrumentation, limiting current, the current-voltage curve, half-wave potential data, the suppression of maxima, techniques of quantitative polarographic analysis, amperometric titrations, and special techniques he achieves a workable and theoretical introduction to the subject — no mean feat.

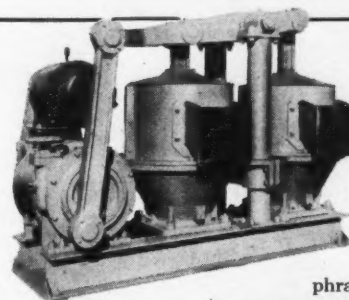
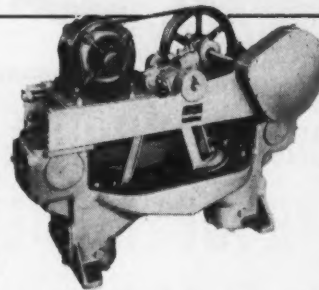
Skillful treatment is matched with detailed working directions that enable one to perform experiments that substantiate the theory. Trouble shooting in polarographic circuits share the 73-page appendix with half-wave potentials and diffusion current constants of inorganic substances. The book is amply documented with 433 references.

To obtain "Polarographic Techniques" remit \$6 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N.Y. Specify CP 2532 opposite last page.

for maximum flow,
long life,
minimum maintenance

DORR-OLIVER Type V Pump

For removing underflows from Thickeners and Hydro-separators by positive displacement. Twin pumping chambers with individual suction and discharge connection for each chamber. Adjustable stroke while pump is running. Six sizes to handle up to 30 cu. ft. of pulp per minute. Write for Bulletin No. 5001.



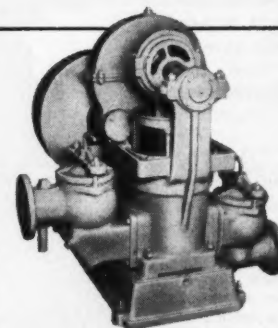
DORR-OLIVER Type W Pump

A rugged duplex diaphragm pump designed for big tonnage operation featuring variable stroke adjustment while pump is running. Available in 6" and 8" models to handle up to 75 cu. ft. of pulp per minute. Write for Bulletin No. 5002.

DORR-OLIVER Plunger Pump

A dependable unit for pumping sludges in municipal and industrial water and waste treatment plants. Adjustable eccentric permits stroke variation of 1" to 5". Can be controlled by program time clock for optimum 24-hour operation. Write for Bulletin No. 5182.

Dorr-Oliver engineers, backed by 51 years of pump design and application, will gladly discuss your pumping problems. Write for their assistance.



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DORR-OLIVER PUMPS

If You Have a
CORROSION
Problem...

**Depend on GOODALL
and "RUBBERHIDE"
for the Right Answer!**

No matter what your corrosion problem may be, you can rely on Goodall engineering experience and technical skill to produce "Rubberhide" Linings in a specific compound that will provide the final solution. Compounded from rubber or neoprene to provide proper resistance to the specific corrosive agents involved, or to combat abrasive wear, these modern Linings will repay many times their cost through extended life of the products, parts or equipment to which they have been applied . . . from thumb screws to 20,000-gallon tanks.

"RUBBERHIDE" Linings are processed to objects shipped to our Linings Plants in Trenton, Chicago or Houston; or, when the objects are too large for such shipment, or the work involves fixed plant equipment, experienced field crews do the processing "on location". Whether factory or field processed, "RUBBERHIDE" Linings will assure effective, long-lasting protection.

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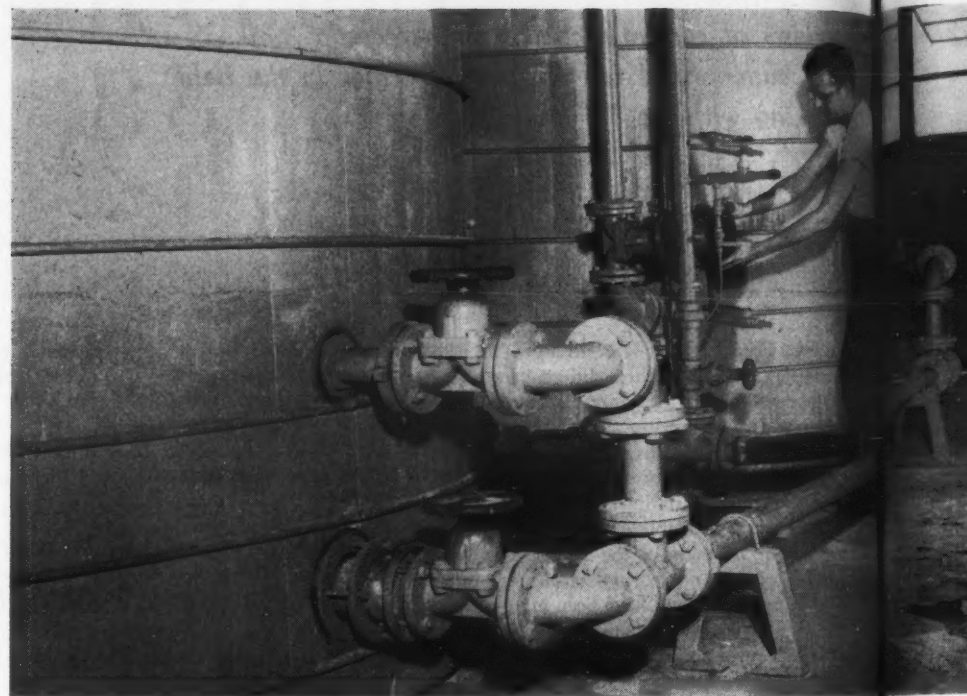


When inquiring check CP 2534 opposite last page

corrosion control

By **TED F. MEINHOLD**,
Assistant Editor

CP Staff Photos



Saran-lined pipe reduces shutdowns, cuts maintenance, and . . .

speeds rare earth production

Corrosion-resistant pipe handles dilute sulfuric, hydrochloric, dilute hydrofluoric, and phosphoric acid mixtures

Problem: When Lindsay Chemical Company decided to build its new \$2.5 million plant addition, engineers knew that improper selection of pipe could mean plenty of trouble and be quite costly. Nearly 25,000 ft of pipe would be required and most of it would be taking a severe beating — handling sulfuric, hydrochloric, hydrofluoric, or phosphoric acid mixtures of rare earth and thorium chemicals.

Temperatures and concentrations of the mixtures would vary. Sulfuric acid concentrations, for example, may vary from 2 to 50%, with temperatures going up to 175°F. Located at West Chicago, Illinois (about 35 miles west of Chicago, Illinois), company is largest producer of rare earth and thorium chemicals in US.

Solution: Based on experience in their original plant, Lindsay engineers selected saran-lined pipe and fittings for some of the toughest applications. Nearly 60% (about 15,000 ft) of the chemical process pipe in the new addition is of this type.

Sizes range in diameter from 1" to 3".

Pipe actually consists of two pipes in one, being made by swaging saran pipe inside rigid steel pipe. Using modified pipe-fitter's tools, pipe can be cut and threaded just like conventional pipe. Inner liner is rugged and has been known to last for years with minimum wear. Pipe is rigid and requires few supporting members for installation. Fittings withstand pressures up to 150 psi.

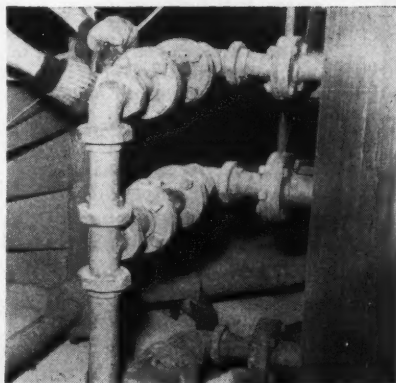
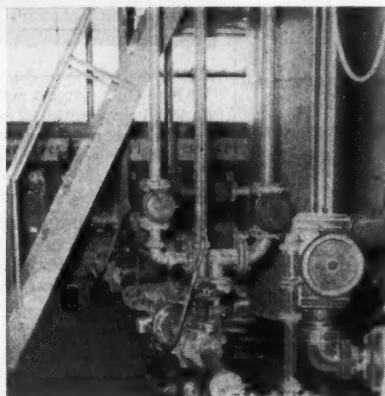
Results: Engineers are satisfied with pipe's performance. Absence of leaks reduces shutdowns, speeds production, and results in safer working conditions. Maintenance costs on pipe have been low.

(For more information on saran-lined pipe, which is made by The Dow Chemical Company, contact Saran Lined Pipe Company, Dept. CP, 2415 Burdette Avenue, Ferndale 20, Michigan . . . or for more information check CP 2535 on form which is located opposite last page.)



Saran-lined pipe successfully handles sulfuric, hydrochloric, hydrofluoric, or phosphoric acid mixtures of rare earth and thorium chemicals

Over 15,000 ft of pipe installed in plant's new addition is saran-lined



Elimination of leaks results in safer working conditions

BUT CORROSION-PROOF



Corrosion resistance is not enough to stop acids or alkalis from chewing up a motor in a hurry. That is why the wise engineer selects Reliance Corrosion-Proof Motors for corrosive service.

These motors are built to withstand the onslaught of destructive chemicals for years. Housings are made of virtually indestructible cast iron. Exterior contours are designed to slough off liquids—no nooks and crannies to retain corrosive elements. Enclosures are sealed to prevent any leakage . . . Metermatic lubrication systems provide complete protection against burned out bearings and contaminated lubricants.

Anyway you look at them, Reliance Corrosion-Proof Motors can take it—and you're not limited in the choice of motors either. A complete line of a-c. motors, 1 thru 300 hp., is available in all mountings, frequencies and voltages.

Why not call your Reliance representative today and get all the details.

B-1505

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Totally Protected
MOTORS

RELIANCE **ELECTRIC AND ENGINEERING CO.**

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When inquiring check CP 2536 opposite last page



VYFLEX *FLIGID*® lining stops sodium hypochlorite

The problem solved by lining the tank shown above with Fligid is particularly important because it is so widespread. Invaluable as an industrial bleach, sodium hypochlorite has a voracious appetite for just about every known lining or coating material. The bleach decomposes some on contact. It permeates others, raising gas blisters that force the lining away from the tank wall.

But nothing happens to *Fligid*! Sodium hypochlorite is completely powerless against this amazing new laminate of two different Polyvinyl Chloride based membranes. Furthermore, the cost of lining a tank with Fligid is negligible compared to the cost of replacing the tank.

The exposed face of *Fligid* is unplasticized PVC, able to resist the widest range of corrosives, at temperatures to 190 F in many solutions. There's no plasticizer to leach out and contaminate reagents. And this outer face is harder and more abrasion resistant than any other lining material. The inner face is resilient, flexible PVC, easily applied to steel, wood, or concrete, by simple adhesive bonding techniques with no curing. Qualified Kaykor applicators across the United States and Canada give fast, professional service applying *Fligid* to any size or shape structure in the field or in the shop.

GET THE FACTS! Write now for the complete story, including all technical data, in the just published technical sheet "*Fligid*"...free on request to Kaykor Industries, Inc., 4401 Broad Street, Yardville, New Jersey.

K KAYKOR INDUSTRIES, INC.
Division of Kaye-Tex Manufacturing Corp.
YARDVILLE, NEW JERSEY

When inquiring check CP 2537 opposite last page

CORROSION CONTROL

**Resistance to gasoline,
acids, alkalis given
by concrete coating . . .**

seals underground tanks and excavations

Uses: For sealing underground excavations and concrete tanks to provide a source of storage for bulk liquids.

Features: Coating is resistant to gasoline, oils, propane, butane, acids, ammonia, alkalis, and to most chemicals and solvents. Coating retains flexibility over temperature range from -65 to +300°F.

Description: Concrete coating is an emulsion of neoprene and silicone rubbers which together with other resins and compounding agents, cure to a tough film. In addition to concrete, satisfactory sealing can be obtained in limestone, sandstone, shale, and granite.

(Rock-Seal sealing coating is a product of Storage and Sealing Corp., Dept. CP, 826 Andrus Bldg., Minneapolis 2, Minn. . . or check CP 2538 on form opposite last page.)

**Humble refinery reduces corrosion
of explosion-proof enclosures
with above-ground manholes . . .**

units also increase safety of electrical system at paraxylene plant

At Humble Oil & Refining Company's Baytown, Texas, refinery, above-ground manholes (Fig 1) for explosion-proof electrical enclosures serve the purpose of a manhole (where underground feeder cables are

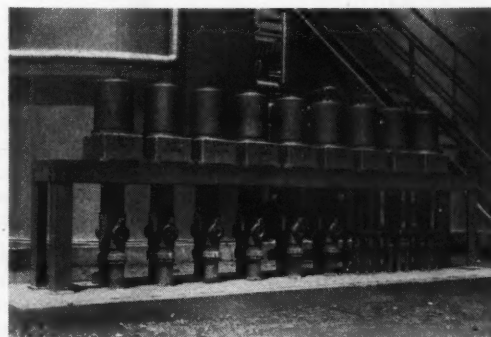


Fig 1—Above-ground manholes in paraxylene plant at Humble Oil & Refining Company's Baytown refinery

spliced or tapped) without having a place for hazardous hydrocarbon vapors and water to collect and cause corrosion. Drain at bottom of each housing is opened periodically to remove any water that accumulates by condensation from the humid air. Condensation is minimized by breathers on top of

FROM RAINDCAP TO HOOD



Specify **PLA-TANK**
for your DUCT
SYSTEM



Illustrated above is part of a new PLA-TANK Duct System which is typical of dozens being installed for fume exhausts in plating rooms, maintenance shops and chemical processing plants. PLA-TANK was chosen for the entire system from hoods to raincaps on the outside stacks.

Included in the system (in addition to hoods, ducts, stacks and caps) are molded PLA-TANK fan housings and propeller-type fan blades. *Everything that contacts the fumes is molded of chemical-resistant PLA-TANK.*

PLA-TANK, molded from long-life, resin-bonded glass fibre laminate is resistant to a wide variety of fumes and temperatures. It is lightweight, easy to install, competitively priced.

PLA-TANK can be the answer to your duct system problem. Let us help you the modern way — with PLA-TANK.

First in the field — and still the leader

Send for free data sheets

PLA-TANK, INC.

DIVISION OF

THE Chemical CORPORATION

Dept. 63 • West Warren, Massachusetts

When inquiring check CP 2539
opposite last page

CHEMICAL PROCESSING

each unit which serve to ventilate each enclosure as temperature changes cause contraction and expansion of air inside.

Drains and breathers on the above-ground manholes do not impair the explosion-proof integrity of the electrical system. Underwriters Laboratories requirements for a Class I, Group D system are fully met.

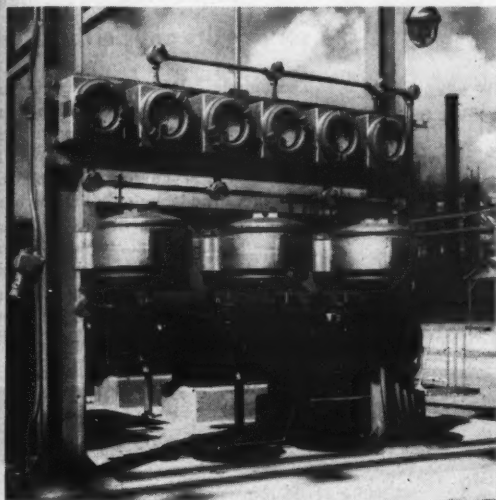


Fig 2—Rheostats, ammeters, and other instruments are enclosed in these explosion-proof housings

Above-ground manholes are used in Humble's paraxylene plant as well as in other areas. Refinery also makes extensive use of other types of explosion-proof enclosures (Fig 2).

(For further information on above-ground manholes and other types of explosion-proof enclosures check CP 2540 on form opposite last page.)

Lengthen cathodic protection with plastic-coated cable

Cathodic protection cable consists of a stranded flexible conductor of copper or aluminum, polyethylene insulation and polyvinyl chloride jacket. All-thermoplastic construction is resistant to moisture, acids, alkalis, oils, greases, weathering, and abrasion. These properties of cable lengthen the life of cathodic protection installations. The polyethylene insulation has low dielectric constant, high dielectric strength and corrosion resistance. Cable is available with copper conductors in sizes 8 to 4/0 Awg and with aluminum conductors in sizes 6 Awg to 350 Mcm.

(Cathodic protection cable Type CP is a product of Anaconda Wire and Cable Co., Dept. CP, 25 Broadway, New York 4, N.Y. . . . or for more information check CP 2541 on form which is located opposite last page.)



WE DON'T STOP WITH THE DELIVERY OF A CHEMICAL — we put it to work and keep it working effectively

The chemical treatment of metals and metal parts—to prepare them for further processing, to protect them, to beautify them—has grown from a haphazard operation to a highly technical one. Supplying the chemical ingredients is a relatively simple job. Putting them to work and keeping them working effectively in your plant demands the skill of an experienced organization. We have that organization.

We supply not only the metal-treating chemicals, but also—free of charge—the technical and engineering service to keep them working at top efficiency. We

furnish assistance in developing and installing the process, we maintain continuing inspection of the process and equipment if you so desire, we check samples of the processed metals in our Quality Control Laboratories—all these are part of the ACP service at your command.

That's why we say, "We don't stop with the delivery of a chemical—we put it to work and keep it working effectively." And we have been doing this for over 40 years. Write for a booklet describing ACP products and services.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 29, Pa.

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When inquiring check CP 2542 opposite last page

STOP



SPRAY
it...

PUMP



and
FUSE
it!

WEAR

with Colmonoy Sprayweld Hard-Facing

Colmonoy hard-facing alloys protect against corrosive and abrasive wear. They make pump plungers, pistons, rings, bushings—any pump part, last longer.

The Colmonoy Spraywelder puts these alloys on fast, in powder form. It makes smooth overlays, within .010" of desired size. Spraywelder applied overlays are welded to the base metal and require a minimum of finishing.

Eliminate time consuming hand application of hard-facing alloys and difficulties in distortion and machining. Eliminate the use of expensive corrosion resistant metals as base materials. Write today for more information on how Spraywelding can stop your pump wear.



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See us at Booth 339, 25th Exposition of Chemical Industries.

When inquiring check CP 2543 opposite last page

CORROSION

**Flux of paste solder
is non-corrosive . . .**

can be used on electrical and electronic equipment

Uses: As a paste solder for use on electrical and electronic equipment.

Features: No corrosion develops from the flux residue. Material is easily applied, and any excess can be readily removed. It can be used for all delicate soft-soldering operations as well as routine. Paste solder is creamy in substance and will cling to objects and surfaces other than in the horizontal plane. It can be applied with brush, spatula, or with a hypo-needle to hard-to-get-at places.

Description: Powdered solder is suspended in a non-corrosive flux that can be used with soldering iron, flame, oven, or induction heating. It cleans, tins, and solders in one operation.

Active material has cleaning action, is not quickly dissipated, is inert at room temperatures, deliquescent to a very marked degree, and water soluble with very low ionization. It does not contain zinc or other chlorides.

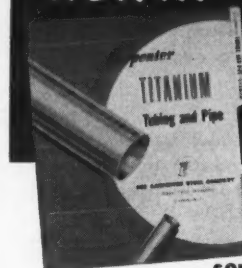
(Non-corrosive paste solder is a product of Mico Instrument Co., Dept. CP, 78 W. Trowbridge St., Cambridge 38, Mass. . . or check CP 2544 opposite last page.)

**Tells how tin helps
zirconium**

Ten-page publication tells how a small amount of tin is alloyed with zirconium, providing protection from corrosion in water-cooled nuclear reactors and, at the same time, not interfering with the chain reaction. Zircaloy-2, which was developed by Westinghouse, is discussed. This alloy contains 1 1/2% tin.

September 1955 issue of "Tin News" is issued by The Malayan Tin Bureau, Dept. CP, 1028 Connecticut Ave., Washington 6, D.C. When inquiring specify CP 2545 opposite last page.

**New... TITANIUM
Tubing and Pipe
BULLETIN**



... a guide to
improving equipment
service life and performance

**NEW advantages
for these fields:**

- CHEMICAL
- FOOD
- PETROLEUM
- MARINE
- PAPER
- and OTHERS

The unique combination of properties in Carpenter TITANIUM Tubing and Pipe may be the best solution to some tough corrosion control problems in equipment you make or use. This bulletin gives you technical data you need to make the most profitable use of this unique and versatile metal in your product or plant. Advantages, applications, corrosion resistance, physical properties, and workability are concisely covered. Ask for Bulletin T. D. 115.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, New Jersey

When inquiring check CP 2546 opposite last page

STOP VALVE CORROSION ...at lower cost

For handling most corrosive fluids, there's an Ace rubber, rubber-lined or plastic valve that will stop corrosion failures without costing you a fortune. Check this partial list:



- | | |
|--|-------------|
| Plastic Diaphragm Valves | 1/2" to 2" |
| Rubber-Lined Gate Valves | 2" to 24" |
| Rubber-Lined Diaphragm Valves | 1/2" to 14" |
| Rubber-Lined Check Valves | 2" to 24" |
| Hard Rubber Plug Valves | 1/4" to 5" |
| — plus bibb cocks, ball check valves, float valves, etc. | |

For lists of chemicals that can be handled and other details write today to:

AMERICAN HARD RUBBER COMPANY
93 Worth St., New York 13, N. Y.

Manufacturers of quality rubber and plastic fluid-handling and processing equipment since 1852

ACE rubber and plastic

processing equipment • SINCE 1852

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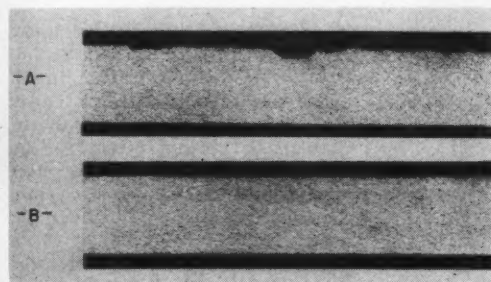
CHEMICAL PROCESSING

**Corrosion of aluminum equipment
contaminated by mercury
prevented by heating . . .**

technical paper also suggests other methods for reducing mercury corrosion

Technical paper covering recent research points out that damage to aluminum equipment contaminated by mercury can be decreased if the processing unit is heated in free air. For example, results indicate that almost 100% removal of mercury can be achieved in two or three hours heating at temperatures in excess of 200°C. Heating at 150°C for one hour removed 98% of the mercury. Steam at 150°C was found to remove mercury as well as air at 150°C.

Cross section (A) of photo shows corrosion that occurred when a drop of 1000 ppm mercuric chloride



Comparable cross sections of:
A) 3003-14 contaminated with mercury
B) same but mercury removed by heating
Both exposed to 3 1/2% NaCl for one week

solution was placed on an aluminum specimen for a few minutes, rinsed, and exposed in 3 1/2% sodium chloride for one week. Cross section (B) of photo shows an identical specimen treated in the same manner except that it was heated for four hours at 100°C after being contaminated by mercury and before being exposed to NaCl solution. Weight loss of the heated specimen was only 1/10th that of the unheated specimen.

For special applications where it is not feasible to heat equipment as outlined, chemical stripping treatments can satisfactorily remove mercury from aluminum and prevent corrosion.

Research work also showed that aluminum picks up only negligible quantities of mercury in quantities below 0.1 ppm and probably does not accelerate corrosion at this concentration. Another result of practical importance is that the higher the purity of the aluminum, the greater the tendency for it to corrode in mercury-contaminated solutions.

(Condensed from technical paper, "A Radiochemical Tracer Investigation of the Role of Mercury in the Corrosion of Aluminum," by R. C. Plumb, Dr. M. H. Brown, and Mr. J. E. Lewis, Aluminum Co. of America, Dept. CP, Pittsburgh, Pa. Paper was delivered at the 1955 Annual Meeting of NACE.)

INDUSTRY'S MOST SHOCKING WASTE...

CORROSION COSTS EQUAL 25% OF NET PROFITS!

INSTALLATION BY INDUSTRIAL FILTER PUMP MFG. CO., CHICAGO, ILLINOIS



*Made from Exon 900 Series resins by Kaykor Industries Inc., Division of Kaye-Tex Mfg. Corp., Yardville, N. J.

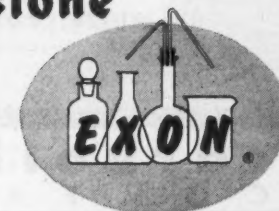
CROWN RHEOSTAT stopped corrosion cold with VYFLEX L-10*

CHICAGO, ILL. Crown Rheostat and Supply Co. faced a 2-headed problem. Bright Nickel Plating solutions rapidly corrode the 30-foot tanks they used. But tank-linings contaminate the sensitive solution — unless they are 100% inert! Crown solved the problem with a 3/32"-thick lining of VYFLEX L-10, a tough PVC based on Firestone Exon 900 Series resin. Result ... corrosion: zero. Contamination: zero.

You can stop corrosion!

EXON PVC resins are the bases for a wide variety of lightweight structural rigids, linings, coatings, pipes and fittings . . . engineered specifically to wipe out your particular corrosion problem. To stop Industry's most shocking waste, call:

Firestone



CHEMICAL SALES DIVISION
FIRESTONE PLASTICS CO., Dept. 68B, POTTSTOWN, PA.
A Division of the Firestone Tire and Rubber Company

When inquiring check CP 2548 opposite last page



on-the-job PROOF!

Test patch of Phenoline 300 at passenger car wash station of a large Eastern Railroad. Patch was subjected to continual spillage of acid cleaning compound (sulphuric) and extremes of weathering. Material applied as 2 coats with total thickness of $\frac{1}{8}$ inch. After 1 year of service, almost $\frac{1}{2}$ inch of unprotected concrete had corroded away. Phenoline-protected concrete remained unaffected with bond of Phenoline to concrete still perfect.

PHENOLINE 300 protects concrete... under severe corrosive conditions

Structural weakening... hazardous footing... accumulation of water and corrosives... expensive replacement. These are a few of the costly results when floors, pump bases and other concrete areas are not protected from corrosion. This wasteful destruction can be prevented—even under very severe corrosive conditions—with Phenoline 300.

- Highly resistant to acids, alkalis, solvents.
- 100% solids.
- Can be applied over new or old concrete, asphalt, brick or wood.
- Fast thermo-setting at room temperature—no baking required.
- Easy to wash down and keep clean.
- Protects against back-pressure and seepage.
- Can be troweled, brushed or sprayed.
- Available in any color.

WRITE TODAY for new Phenoline 300 Series Bulletin, 4" x 4" sample of troweled Phenoline, corrosion data and prices.

carboline
C O M P A N Y

333 Thornton Ave., St. Louis 19, Mo.

A Division of Mullins
Non-Ferrous Castings Corporation

Specialists
in Corrosion Resisting
Synthetic Materials

When inquiring check CP 2549 opposite last page

CORROSION CONTROL

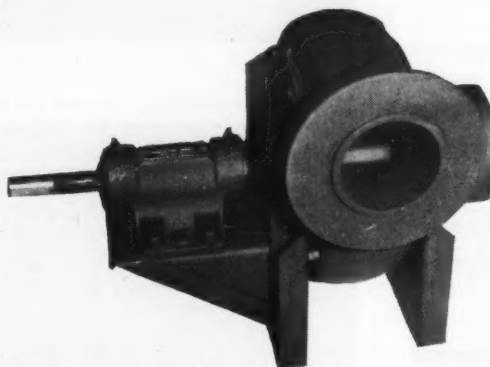
**For highly corrosive fumes,
blowers are lined
with Haveg...**

units with housings molded of the plastic are also available

Uses: For handling a wide variety of corrosives.

Features: Blowers are designed for long service in corrosive applications.

Description: Blowers are available in two types, the first of which is constructed of cast iron lined throughout with $\frac{3}{8}$ " of Haveg. Haveg is a plastic containing phenol-formaldehyde resin and an acid-



This blower is lined throughout with $\frac{3}{8}$ " of corrosion-resistant plastic

digested asbestos fiber. Plastic is used for the ring around the inside of the blower outlet. Wheel is also lined with this same amount of the plastic.

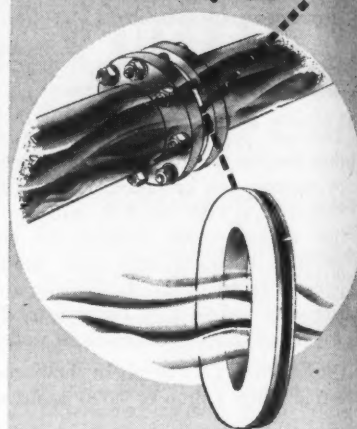
Second type of blower has a housing completely molded of Haveg. Blast wheels on both types are of the six-blade radial type constructed with a non-ferrous core coated completely with Haveg. All exhausters are equipped with heavy duty ball bearings. Shaft is thoroughly protected where it projects into housing. Housings are provided with a drain connection in bottom of housing. Blowers can be obtained in a wide variety of capacities.

(Champion-Haveg exhausters are products of Champion Blower & Forge Co., Dept. CP, Lancaster, Pa. Check CP 2550 on form which is located opposite last page.)

For better ways to whip corrosion...

... try the convenient Product Directory (starting this issue on page 218). You'll find it an easy "page-locator" for ideas, materials, and services.

Unimpeded Flow



CHEMPRO's Style 50 Machined Teflon® Jacketed Gaskets allow unimpeded flow of either liquids or gases. The machined Teflon jacket I.D. fits flush with the flange I.D. Ideal for equipment, valve and piping systems where corrosion resistance and non-contamination of liquid or gas are also required.

By varying the combination of filler materials, the Chempro Style 50 gasket can be made with compression characteristics to meet your specific operating conditions. Fill materials include neoprene, rubber, compressed asbestos, and woven asbestos cloth.

Ordering Information Required

1. Inside and outside diameters.
2. Flange or nozzle material.
3. Operating pressure and temperature of liquid or gas.
4. Equipment make, model and size.

Complete information on Style 50 gaskets is given in Bulletin CP553, Section B.

THE ORIGINAL FABRICATORS OF
TEFLON PACKINGS AND GASKETS
*duPont Trademark



CHEMICAL & POWER
PRODUCTS, Inc.

9 Broadway, New York 4, N.Y.

When inquiring check CP 2551
opposite last page

CHEMICAL PROCESSING

High co
non-ma
in copp

part
desi

Uses:
pin, cott
equipme

Features
has goo
to corro
base all
importa

Pins

Descrip
spring
Each p
than fr
It can
drilled
remain
to 0.25

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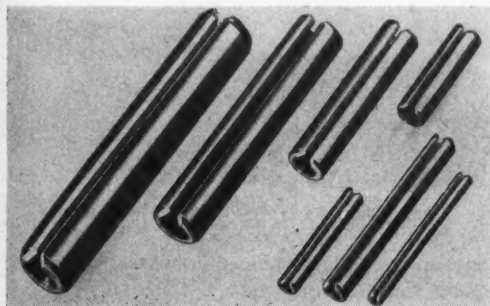
DECE

**High corrosion resistance,
non-magnetic properties
in copper alloy pin . . .**

particularly useful where galvanic action is a design consideration

Uses: As taper pin, set screw, rivet, dowel, hinge pin, cotter pin, or stop pin for chemical handling equipment.

Features: Beryllium copper alloy is non-magnetic, has good electrical conductivity, and high resistance to corrosion. Particularly useful with other copper base alloy components where galvanic action is an important design consideration.



Pins are slotted chamfered tubular beryllium-copper

Description: Device is a slotted chamfered tubular spring pin, heat treated to achieve maximum strength. Each pin has a controlled diameter slightly larger than fractional drill size hole into which it is inserted. It can be easily inserted by hand or machine into drilled holes without special machining, tapping, and reaming operations. Pins come in sizes from 0.062 to 0.250" diameter.

(Rollpin beryllium copper locking pins are a product of Elastic Stop Nut Corporation of America, Dept. CP, 2330 Vauxhill Rd., Union, New Jersey . . . or for more information reader may simply check CP 2552 on the form which is located opposite last page.)

**Circular describes gate valves
for corrosive service**

Causal metal gate valves, designed for corrosive service, are covered in six-page circular. Units described are available in sizes from 1/2 to 8" with 316 stainless steel or Monel trim. Resistance of valves to a wide variety of chemicals is presented in tabular form.

Circular 592 is issued by Lunkenheimer Co., Department CP, Box 360, Cincinnati 14, Ohio. When inquiring reader may simply check CP 2553 on the form which is located opposite last page.



You Can See Why SARAN LINED PIPE is your answer to downtime losses

***It's made of corrosion-resistant saran pipe
swaged right inside rigid steel pipe . . . two pipes
in one for longest-lasting performance.***

Here's really trouble-free piping . . . saran lined pipe, fittings and valves! This modern piping has a durable inner lining that eliminates shutdowns due to corrosion . . . forms tight-fitting joints that prevent leakage. Saran lined pipe, fittings and valves won't burst under working pressures up to 150 psi . . . and saran lined cast steel fittings are available for even higher pressures. Every single piece of saran lined pipe, fittings and valves is carefully spark-tested by hand to be sure there are no pinpoint holidays or cracks in the lining.

Installation costs are low with saran lined pipe, fittings and valves, too. They can be cut and threaded in the field with modified pipe-fitter's tools. And because they're rigid, few supporting members are needed.

If your operation requires the conveying of acids, alkalis, solvents and other corrosive liquids, be sure to investigate saran lined pipe, fittings and valves today. For further information, write the Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale 20, Michigan, Dept. SP529B-2.

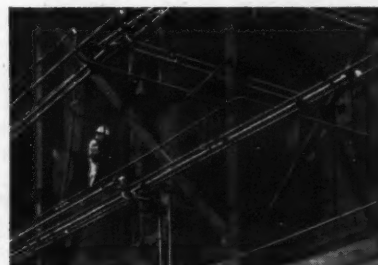
RELATED SARAN PRODUCTS—Saran rubber tank lining • Saran rubber molding stock • Saran tubing and fittings • Saran pipe and fittings.

**SOME OF THE MANY
INSTALLATIONS USING**

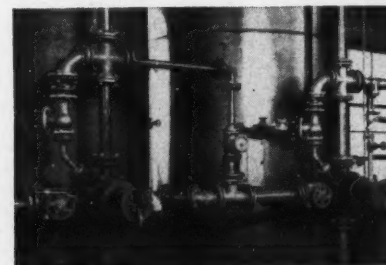
SARAN LINED

STEEL PIPE

*Saran Lined Pipe is Manufactured by
The Dow Chemical Company
Midland, Michigan*



Hydrochloric acid has been conveyed in this installation for well over seven years. Service has been eminently satisfactory.



Saran lined pipe is used here in an automatic water de-ionizer. This installation has also had a long record of uninterrupted service.

you can depend on **DOW PLASTICS**

DOW

When inquiring check CP 2554 opposite last page

CORROSION CONTROL

Protects electrical wiring from fumes, oil, and moisture . . .

flexible conduit resists scuffing, abrasion, and rough handling

Uses: Protection of electrical wiring in chemical plants, food processing plants, or wherever wiring is exposed to adverse conditions.

Features: Flexible conduit utilizes an impervious polyvinyl jacket as a seal against oil, moisture, fumes, chemicals, or other deteriorating substances.

Description: Unit has a flexible galvanized steel



Conduit connections require only standard fittings

core for strength. Combination of steel and plastic resists scuffing, abrasion, and rough handling. It requires no special tools for cutting and connections require only standard fittings.

(Flex-Seal is a product of Columbia Cable and Electric Corp., Dept. CP, 255 Chestnut St., Brooklyn, N.Y. . . . check CP 2556 opposite last page.)

Brochure includes 16 photos of plastic sewer lining

Two-color brochure contains 16 photographs showing some of the major projects in which the continuous plastic sewer lining has been used. This sewer lining is a high polymer vinyl resin sheet which is impervious to hydrogen sulfide and other sewer gases, acids, alkalis, and salts.

Eight-page brochure includes information on composition, physical and chemical properties, and method of incorporating lining in concrete sewer pipe and structures. Lining has T-shaped ribs which project from the back of the sheet.

Brochure on T-Lock Amer-Plate plastic sewer lining is issued by Amercoat Corp., Dept. CP, 4809 Firestone Blvd., South Gate, Calif. When inquiring specify CP 2557 opposite last page.

For more information on product advertised at right, specify CP 2558 . . . see information request blank opposite last page.



SANITARY PUMPS

Designed for the non-agitating, efficient pumping of milk, food products such as diced carrots, cream style corn, tomatoes, applesauce, relish and beverage. Also used in breweries and for the pumping of drugs and chemicals in solution. Available in type 304 and 316 stainless steel and nickel alloy.

INDUSTRIAL PUMPS

Designed for pumping latex, water, brine, light oils, chemicals, paints, brewery products and liquids in the food processing field where lines are of I.P.S. type. This model offers quick disassembly features for ease in cleaning. Available in type 304 and 316 stainless steel, bronze and cast iron.

"PUMP KING" SERIES

Designed for very efficient operation at 1800 and 3600 RPM, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, etc. The 3600 RPM model is especially applicable in the dairy industry where high head and low capacity are essential and for handling low and medium viscosity liquids in the food processing industry. Available in both sanitary and industrial types.

These efficient Tri-Clover PUMPS can pump any product that will flow to them . . .

ANY product that will flow to them can be handled efficiently and economically with Tri-Clover non-agitating centrifugal pumps. Illustrated are just three of the many Tri-Clover pump models used extensively in food processing, brewing and bottling, chemical process and general industrial applications. Pumps are available in stainless steel, nickel alloy, bronze and cast iron.

Designed for efficient liquid transmission and low cost maintenance, these pumps have many exclusive features, among which are—patented screw type impellers with quick-acting impeller clips, lightweight heads with a minimum of parts, casing construction permitting fast, easy assembly or disassembly—and a wide choice of seals for various applications,

including inert carbon rotary seals for sanitary application, packing gland seals, water cooled seals and seals for latex handling.

Tri-Clover's exclusive developments are the result of many years of specialized engineering experience and thorough knowledge of liquid handling. Let our engineering staff work with you in solving your pumping problems.

See your nearest TRI-CLOVER DISTRIBUTOR
EXPORT DEPT., 8 So. Michigan, CHICAGO, U.S.A.

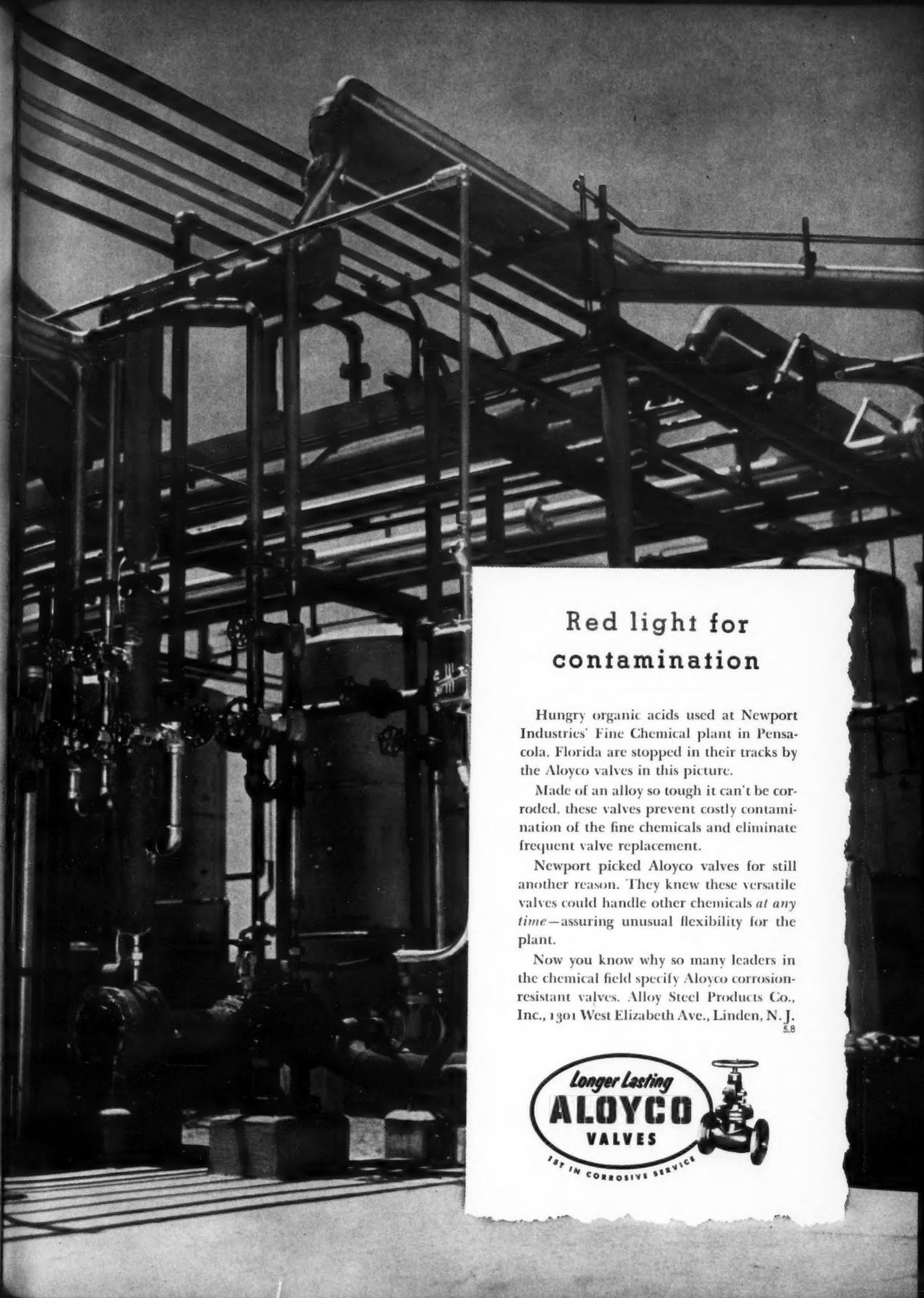
LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

TRI-CLOVER



SEND FOR THE TRI-CLOVER PUMP CATALOG —
One of the most complete, useful pump catalogs ever compiled. Contains engineering data on all types of pump applications. Write for your copy of Catalog 253 today.

When inquiring check CP 2555 opposite last page



Red light for contamination

Hungry organic acids used at Newport Industries' Fine Chemical plant in Pensacola, Florida are stopped in their tracks by the Aloyco valves in this picture.

Made of an alloy so tough it can't be corroded, these valves prevent costly contamination of the fine chemicals and eliminate frequent valve replacement.

Newport picked Aloyco valves for still another reason. They knew these versatile valves could handle other chemicals *at any time*—assuring unusual flexibility for the plant.

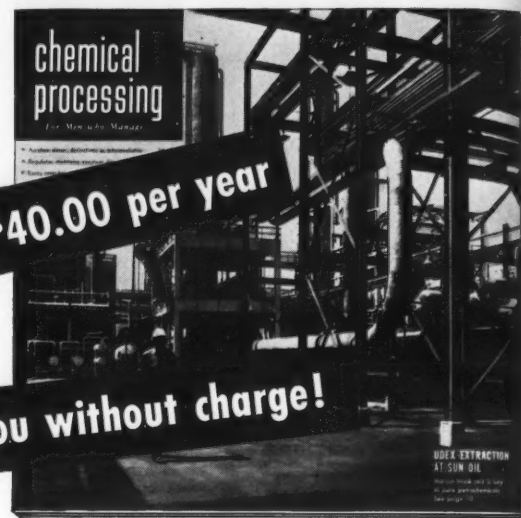
Now you know why so many leaders in the chemical field specify Aloyco corrosion-resistant valves. Alloy Steel Products Co., Inc., 1301 West Elizabeth Ave., Linden, N. J.

5.8



This magazine costs more than \$40.00 per year

...yet comes to you without charge!



Why? Maybe, like many others, you've wondered why **CHEMICAL PROCESSING** comes to you *without charge* — while, perhaps, you pay a subscription price for other business magazines.

Maybe you've thought publishers *make money* when they sell you a \$3.00 or a \$5.00 subscription.

No — publishers lose money ... yes, most business magazines lose money when they sell a subscription — not only because the magazine costs more to produce than the subscription price brings in — but also because the cost of making such sales exceeds the income for \$3.00 or \$5.00 subscriptions.

Advertisers pay the bills — You see, it's the money that comes from advertising that keeps the business magazine publisher in business. So, logically, such advertisers *demand* best possible coverage of folks like you — the important key men who exercise buying power.

So — CHEMICAL PROCESSING "hand-picks" best readers ... and sends the magazine to these key folks, without charge.

For you simply can't get maximum coverage of these important folks by trying to sell subscriptions. These men, limited in numbers, are scattered all over

the U.S.A.: travel and/or direct mail cost money; a large share "forget to renew" each year; and, no matter how much time, money and pressure you put on them, there are always some important men who will never buy.

CHEMICAL PROCESSING gets best circulation ... So, as you can see, to get the best, most effective circulation coverage, the best way is to "hand-pick" the right readers, then send the magazine to them. This gives value to advertisers which can't be gotten in any other way.

That's why ... **CHEMICAL PROCESSING** "hand-picks" only qualified readers ... Men Who Manage chemical processing plants ... presidents, partners, plant managers, foremen, engineers, chemists, directors of research, etc. Then the editors make the magazine so interesting, so valuable, these folks want to read it.*

That's why **CHEMICAL PROCESSING** spends many thousands of dollars on each issue — to give you this valuable service costing more than \$40.00 per year, per reader. That's why **CHEMICAL PROCESSING** comes to you without charge — *you are an important reader in the chemical field.*

**Every issue proves this qualified readership ... by unequalled response from these key readers. May we show you the evidence?*

Chemical Processing

published by Putman Publishing Company



also publishers of:
FOOD PROCESSING
FOOD BUSINESS
"Executive Magazines for Industry"

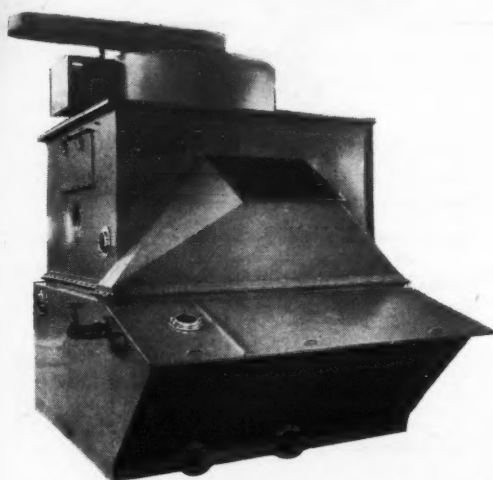
**Rubber-lined fume arrester
with stainless steel rotor
handles corrosives . . .**

contaminants removed from air stream by blanket of water

Uses: For protection against corrosive fumes.

Features: Unit is rubber-lined on all inner surfaces except the stainless steel rotor.

Description: Contaminants are removed from air stream by intersecting it with a heavy blanket of water thrown off tangentially from the independently driven screw rotor drawing water from the built-in reservoir. For compactness, exhaust



For compactness, exhaust fan is built into fume arrester

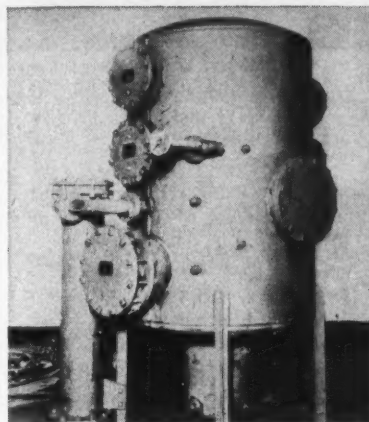
fan is built into the top of the unit and is complete with V-belt drive, guard, and motor mount. Unit is complete with metering type water level control manifold, utility manifold, observation portlights, service and access doors. Varying sizes can be obtained.

(Vertical rotor type fume arrester is product of Schmieg Industries, Inc., 308 Piquett St., Detroit 2, Mich. . . or for more information check CP 2559 on form opposite last page.)

**On glass shell & tube
heat exchangers**

Twelve-page bulletin illustrates, describes, and gives data on Pyrex glass shell and tube heat exchangers. Only glass, chemically-resistant ceramic, and Teflon are contacted by corrosive fluids in the units described.

Bul PE-24 is issued by Corning Glass Works, Dept. CP, 1949 Crystal St., Corning, N.Y. When inquiring specify CP 2560 opposite last page.



This solvent recovery unit—reboiler, condensing and cooling elements—was fabricated of nickel-clad steel.

1 ECONOMY—

High alloy layer—usually 10% or 20% of total plate thickness — assures corrosion and abrasion resistance, long equipment life.

2 DESIGN FREEDOM—

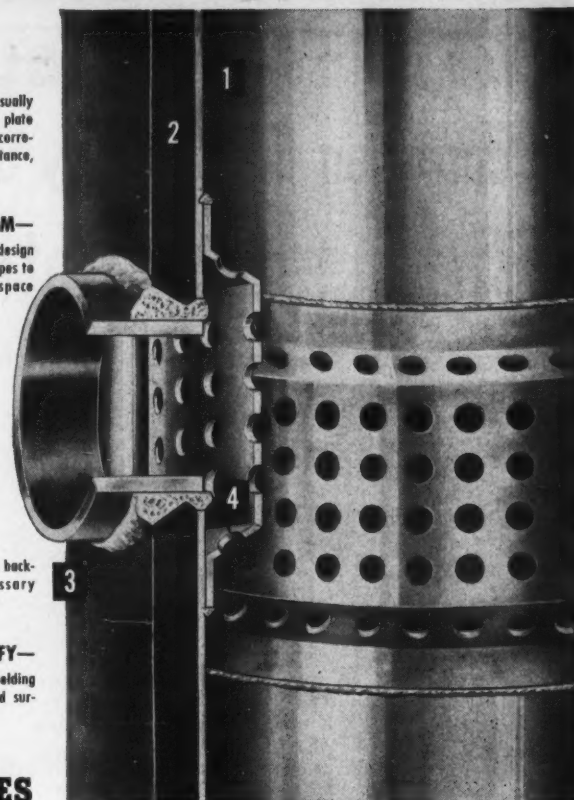
Integral bond allows design and fabrication of shapes to meet process and space needs.

3 STRUCTURAL STABILITY—

Low-cost carbon steel backing provides necessary strength and rigidity.

4 EASY TO MODIFY—

Normal cutting and welding will not endanger clad surface or bond.



CLAD STEEL EQUIPMENT ASSURES

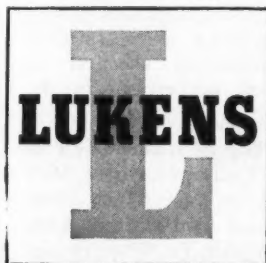
LONG LIFE AND EASY MODIFICATION

To help you overcome the rapid obsolescence caused by process changes when first costs are high, clad steel equipment offers two unique advantages. First, clad steel construction permits easy tank and vessel revision where new openings must be cut and flanges, pipes or attachments welded on. This means you can design for extra-long service life. The bond between cladding and backing will not tear away and allow harmful seepage.

Second, you get long-life protection from corrosion, abrasion and product contamination—all the advantages of solid, high-alloy construction—with savings up to 50% in material costs. The ASME Code permits full gage consideration for design purposes because cladding and backing are bonded over their entire surface.

Long life and low-cost protection, plus other advantages like fast heat transfer, easy cleaning and minimum maintenance, can be obtained from 16 cladding materials that meet a wide range of service conditions.

And qualified equipment builders know best how to apply these to your new processing equipment. By working with your own engineers and consultants from the start, they can help you get longer equipment life at lower cost. Lukens offers the widest available range of clads—stainless, nickel, Inconel, Monel, copper—and cooperates with fabricators in helping you to select the type best suited to your processing needs. If you would like more information, consult one of your builders or write Manager, Marketing Service, Lukens Steel Co., 750 Lukens Building, Coatesville, Pa.



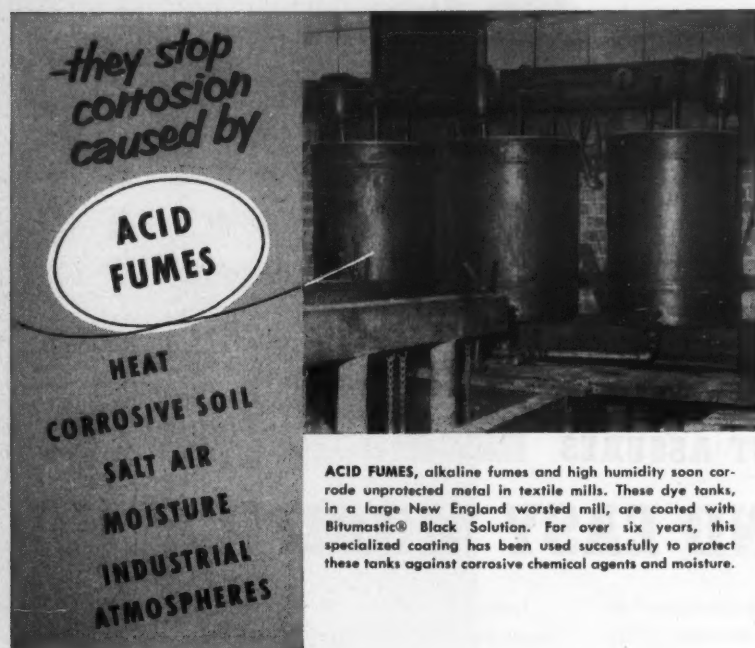
LUKENS CLAD STEELS

STAINLESS-CLAD • NICKEL-CLAD • INCONEL-CLAD • MONEL-CLAD

PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEEL PLATES AND HEADS AVAILABLE

When inquiring check CP 2561 opposite last page

You can solve your **tough** corrosion problems by using **Bitumastic® Coatings**



ACID FUMES, alkaline fumes and high humidity soon corrode unprotected metal in textile mills. These dye tanks, in a large New England worsted mill, are coated with Bitumastic® Black Solution. For over six years, this specialized coating has been used successfully to protect these tanks against corrosive chemical agents and moisture.

TOUGH CORROSION PROBLEMS can be solved, but not by using ordinary paints or conventional protective coatings. For long-term protection, it takes *specialized* protective coatings . . . the Bitumastic Coatings Koppers makes.

Bitumastic Protective Coatings are specially formulated from a tar-pitch base* that is, for all practical purposes, impervious to moisture. These coatings keep moisture away from exposed metal surfaces . . . and that's the *best* way to stop corrosion.

With tough, durable Bitumastic Protective Coatings, a thickness up to eight times that of ordinary paints can be obtained in

one application. Where other factors are equal, the *thicker* the coating the *longer* the period of protection.

Send for a set of free booklets describing the family of Bitumastic Protective Coatings. At the same time, tell us about *your* corrosion problems so that we can suggest a satisfactory solution. There is no obligation, of course.

*Hi-Heat Gray is a non-coal-tar vehicle and metallic pigment.



KOPPERS COMPANY, INC.

Tar Products Division, 1279-T, Pittsburgh 19, Pennsylvania

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

KOPPERS PRODUCTS LIMITED District Offices: Toronto & Edmonton

MADE ONLY BY KOPPERS

BITUMASTIC® PROTECTIVE COATINGS

SOLD THROUGH INDUSTRIAL DISTRIBUTORS



When inquiring check CP 2562 opposite last page

CORROSION

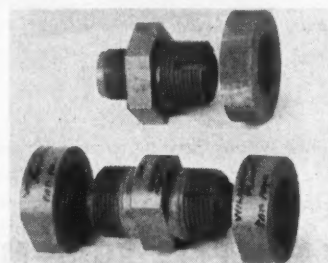
Tight joints are formed by couplings, adapters for polyethylene pipe . . .

no undue compressive stresses set up in pipe

Uses: As fittings for use with polyethylene pipe.

Features: Fittings form a tight joint without setting up undue compressive stresses in polyethylene, and they are resistant to corrosive action.

Description: Couplings and adapters are injection molded



Top — polyethylene-to-metal adapters
Bottom — plastic-to-plastic couplings

from rigid, unplasticized polyvinyl chloride. They are supplied in 3/4" and 1" sizes.

(PVC fittings are products of Wilmington Plastics Co., Dept. CP, 810 S. Heald St., Wilmington, Del. . . or for more information check CP 2563 on form opposite last page.)

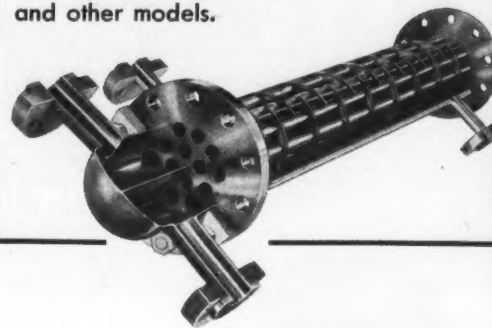
Corrosion protection by metallizing

Four-page, two-color bulletin summarizes variety of metal coatings possible with metallizing for prevention of corrosion. Other applications such as correcting surface defects and imparting chemical or electrical properties are described.

"Metallizing" is issued by Protective Coatings Division, Metaweld, Inc., Dept. CP, Scotts Lane and Abbottsford Ave., Philadelphia, Pa. When inquiring specify CP 2564 on form opposite last page.

Heat Exchangers . . . new low prices

Use of standard stockable components slashes cost of fixed tube sheet designs and other models.



Never before have these standard corrosion-resistant units been offered at such low current prices. Here's what you get—

Specifications—Standard Heat Exchangers (all sizes to 30" nominal shell diameter)

Design Pressure: 75 psi shell side; 75 psi tube side.

Design Temperature: 350°F

Gaskets: Pfaudler Type CBS (Compressed asbestos with special Buna S binder. Suitable for acids and solvents except powerful oxidizers such as HNO₃, hot concentrated H₂SO₄, chlorosulfonic acid, chromic acid, brominations, and H₂O₂.)

Shell and Baffles: Carbon steel or Stainless, type 304 or 316 S.S.

Tubes: Stainless steel, Type 316 or Type 304, 3/4" O.D., 18 gauge, welded.

Tube Sheets: Stainless steel, Type 316 or Type 304.

Bonnets: Stainless steel, Type 316 or Type 304 or Carbon Steel.

Code: Built to ASME Code U-69, and TEMA Class A Specifications.

Write or call your Pfaudler representative for fast delivery, complete specifications and prices on these heat exchangers—plus help in custom engineering a unit to meet any exceptional problems you may have. Or send coupon for Manual No. 837.



THE PFAUDLER CO.

Dept. CP-G-12, Rochester 3, N. Y.

Send Manual 837, giving application data and specifications on stainless heat exchangers.

Name _____
Company _____
Street _____
City _____ Zone _____ State _____

When inquiring check CP 2565 opposite last page

CHEMICAL PROCESSING

**Stainless alloy pickling tank
withstands hot sulfuric
for eight years . . .**

previous materials were used with little or no success

Problem: Wood, acid-proof cement, and conventional grades of stainless steel were used with little or no success for pickling tank handling sulfuric acid at The F. H. Lawson Co., Cincinnati, Ohio. Tanks are used for galvanizing sheet metal products. Each tank contains 4 to 8% of 60 to 66° Be sulfuric acid solution at temperatures ranging from 150 to 165°F.

All of the wooden tanks had a short life and needed constant replacing. Cement-lined tanks, reinforced on the inside with paving bricks, lasted about twice as long as those made of wood. Cracking and other conditions made repairs almost impossible.

Two pickling tanks were made from conventional grades of stainless in 1948 and 1949. Both required a great deal of maintenance after three to four years of service. One deteriorated so badly that it had to be taken out of operation.

Solution: In 1947 one pickling tank was fabricated from No. 20-Cb stainless alloy, a special

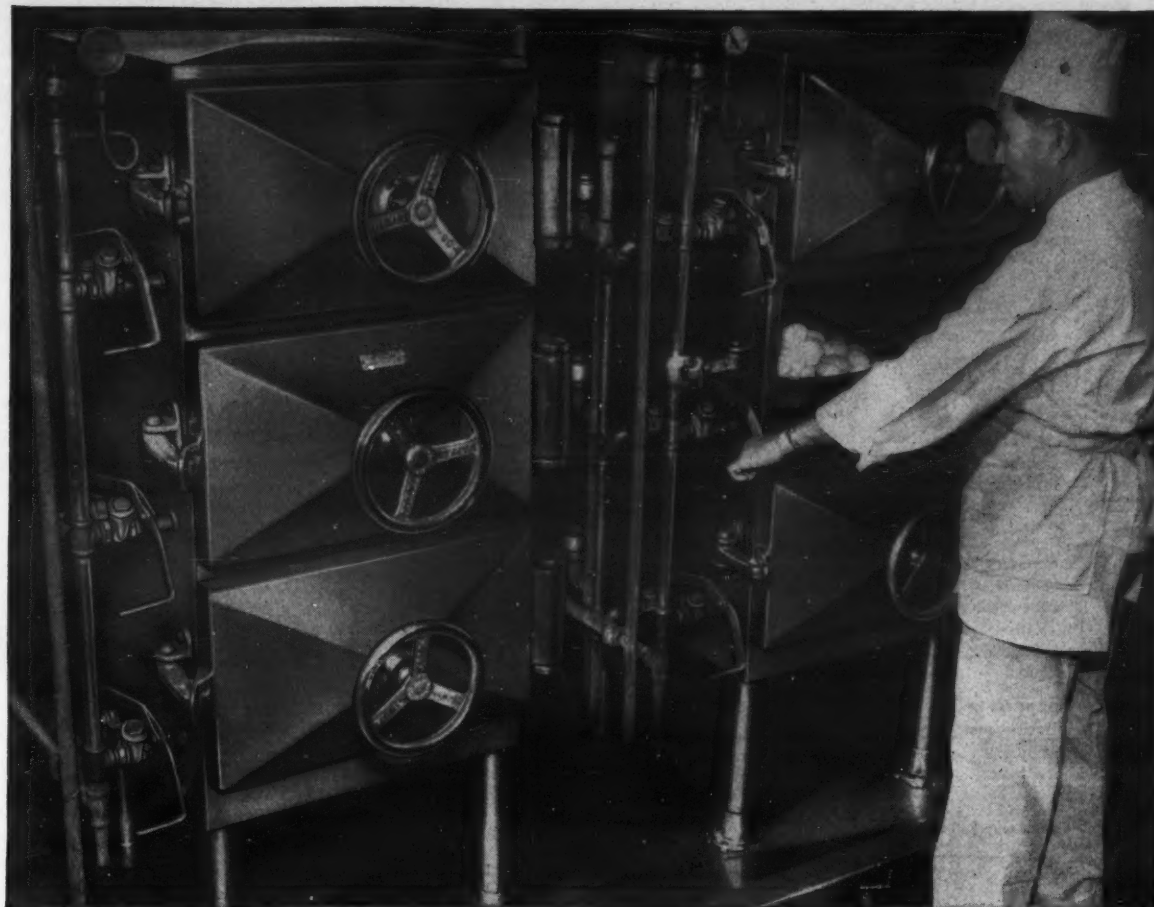


This pickling tank has been in constant use in sulfuric acid service for the past eight years

sulfuric acid-resisting stainless steel. This unit, shown in photograph, is 2½' deep, 4' wide, and 12' long. Tank has been in constant use since it was placed in service, most of the time in a two-shift operation.

Results: This pickling tank made from 20-Cb alloy has required practically no maintenance during the eight years it has been in service.

(No. 20-Cb stainless alloy is a product of Alloy Tube Div., The Carpenter Steel Co., Dept. CP, 110 Springfield Rd., Union, N. J. . . . or for more information reader may simply check CP 2566 on the Reader Service slip which is located opposite last page.)



**Over 80,000 operations with these Crane valves
Maintenance cost: zero**

THE CASE HISTORY—More than 6 years of long-day service—with not one penny of maintenance cost to date! That's the record for Crane valves on these Market Forge steam cookers in Chicago's world-famed Conrad Hilton hotel.

Operated an average of 35 times daily, each of the 24 quick-opening Crane brass gate valves on this installation keeps handling the flow of steam with highest efficiency.

Their cam and lever action remains smooth and positive. They open wide without flow restriction

. . . they seat tightly, with no appreciable seat wear or erosive effects. There's no leakage through the cap joint or around the operating mechanism.

The Market Forge Co., Everett, Mass., finds these Crane No. 432 quick-opening valves well adapted to its famous cookers. It's a case of protecting a good product with quality equipment and giving buyers added value. The Conrad Hilton's experience is duplicated wherever these cookers are installed.

Whether you use quick-opening

valves as machinery components or in plant service piping, you'll find Crane quality designs for all your needs. Crane makes them in gate and globe types, in brass and iron—for steam, water, oil, gas, air, gasoline, etc.—in a wide range of sizes. Your local Crane Representative can give valuable help in selecting these valves for your specific needs.

Crane Co., General Offices, Chicago 5, Ill. Branches and Wholesalers serving all areas.

CRANE CO.

**VALVES • FITTINGS • PIPE
KITCHENS • PLUMBING • HEATING**



CRANE'S FIRST CENTURY...1855-1955

When inquiring check CP 2567 opposite last page

WHAT KILLS YOUR PUMPS?

CORROSION...ABRASION...VIBRATION?

Heavy rubber or special linings molded in the case to resist corrosion and abrasion

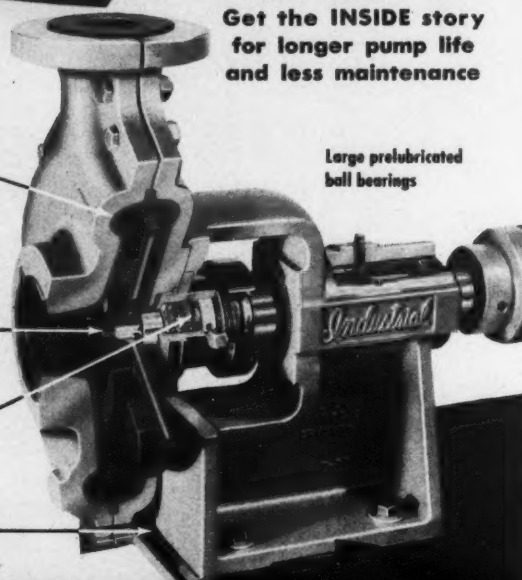
One-piece molded impeller and oversized shaft prevent oscillation

Easy access to corrosion-proof stuffing box

Rubber covered base

Get the **INSIDE** story for longer pump life and less maintenance

Large prelubricated ball bearings



Industrial RESISTS ALL 3

Lined to suit the job... the rubber formula most resistant to the fluids you handle can be supplied by INDUSTRIAL'S rubber compounding and lining division. Neoprene, Saran, Hypalon and Hycar are also available. INDUSTRIAL'S experienced chemists and engineers will help you select the ideal lining and pump size.

Wide range of sizes available with capacities to 450 gpm.

Write for 8-page bulletin with head, GPM and efficiency graphs.

CENTRIFUGAL PUMPS • PRESSURE FILTERS • ION AND HEAT EXCHANGERS • RUBBER LININGS • WASTE TREATING EQUIPMENT

Industrial

INDUSTRIAL FILTER & PUMP MFG. CO.

5908 Ogden Avenue • Chicago 50, Illinois

When inquiring check CP 2568 opposite last page

CORROSION CONTROL

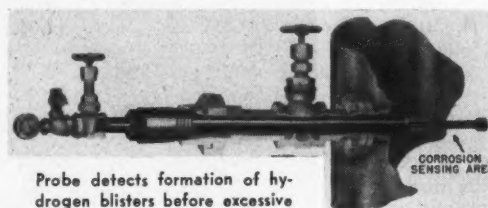
Sensing probe gives warning of hydrogen blisters

Can be inserted or removed from vessel while in service

Uses: To give a warning of the formation of hydrogen blisters in the walls of processing vessels.

Features: Probes are designed so they can be removed and inspected or replaced from pressure processing tanks without taking vessel out of production or off the stream.

Description: Hydrogen probe is made of seamless carbon steel tubing. One end is closed and machined to make a thinner walled section called



the corrosive-sensing area. This end is inserted into the chemical processing vessel, the other end extending outside the vessel, and is held in position with fittings and pressure-tight packing.

If conditions inside the vessel favor the formation of hydrogen blisters, these blisters will be formed inside the thinner walled section of the probe before excessive damage is done to wall of vessel. A change in pressure will be shown on the probe outside the vessel. Whatever protective action is necessary can then be taken. Probes are made 18, 24, or 36" long for different size vessels and are available in three different types of mountings.

(Hydrogen probe is product of Dept. PR 28, Texteam Corp., Dept. CP, 320 Hughes St., Houston 11, Tex. Check CP 2569 on form opposite last page.)

Treats hard rubber lined valves for corrosion service

Sizes, dimensions, and construction details on company's rubber lined valves are given in four-page condensed bulletin. A brief description of valve action is presented with detailed sectional drawings included.

"Darling rubber lined valves for corrosive services" is issued by Darling Valve & Manufacturing Co., Dept. CP, Walnut & Marshall Sts., Williamsport, Pa. When inquiring specify CP 2570 on form opposite last page.

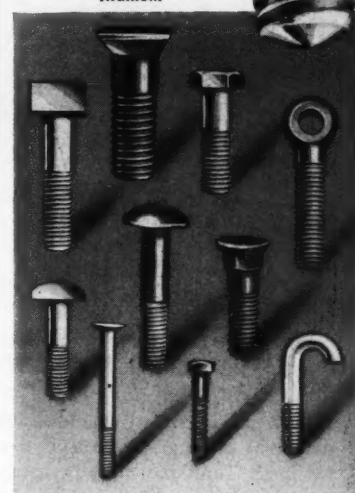
Threaded Specialties

lower cost
EYE BOLTS
by an
exclusive method

Among Pawtucket's many specialty products are these lower-cost eye bolts or "swing" bolts. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes 1/4" and larger, or to your specifications. In any size, you can depend on uniform Class 3 fit, if required.

All standard steels, stainless steels and non-ferrous metals, including Titanium



BETTER BOLTS SINCE 1882

PAWTUCKET

MANUFACTURING COMPANY
327 Pine St. • Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

"The Bolt Man"

When inquiring check CP 2571 opposite last page

CHEMICAL PROCESSING

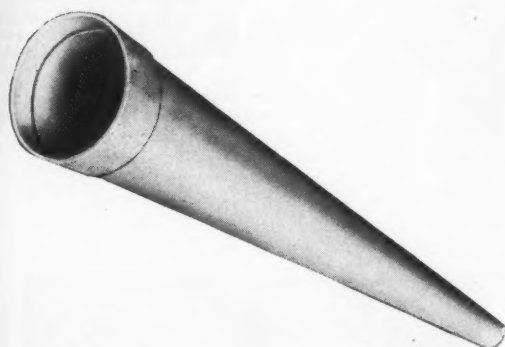
**Resistance to corrosive action
of most liquids and gases
provided by plastic pipe . . .**

glass fiber reinforced pipe satisfactory for moderately high pressures

Uses: Pipe is intended for use under corrosive conditions.

Features: Thermosetting resins used provide excellent resistance to the corrosive action of most liquids and gases. In addition, pipe can be built for service where moderately high pressures and temperatures are encountered.

Description: Method of fabricating is such that the glass fiber reinforcement can be oriented to



Reinforced plastic pipe can be furnished in diameters up to 36"

provide needed strength for different requirements. Selection of resins (principally modified epoxies) is available for special needs.

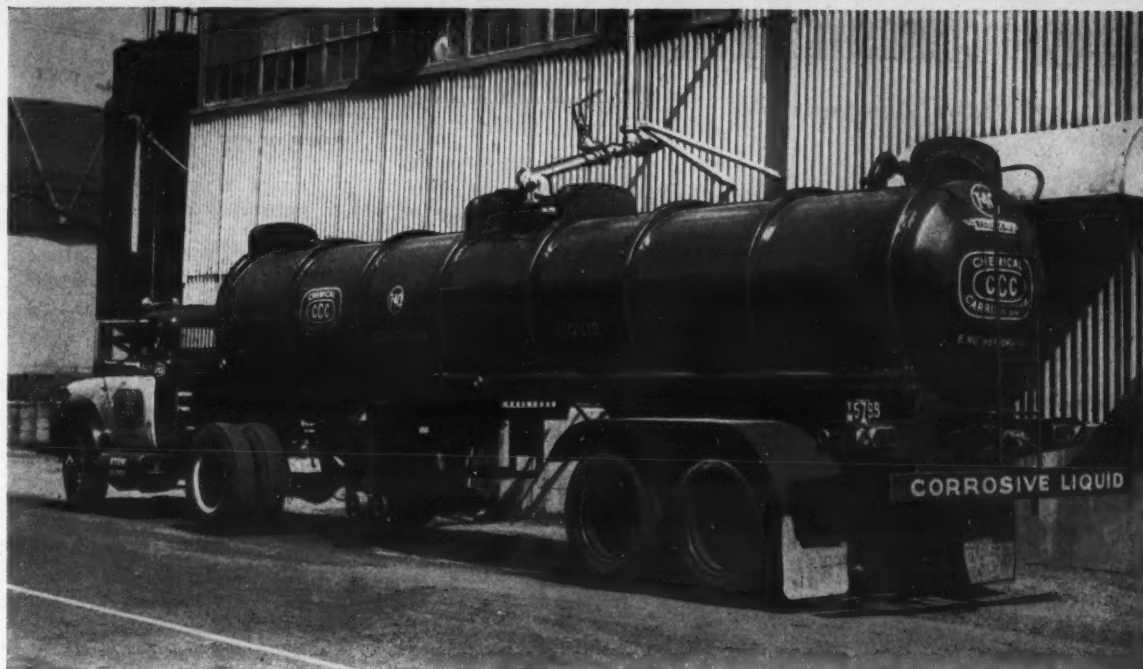
Pipe is available in inside diameters from 1-3/4 to 12". Manufacturing methods are such that almost any diameter and wall thickness up to 36" diameter could be supplied on a custom-built basis. Couplings and other fittings of several types are available with standard sizes.

(Glass fiber reinforced plastic pipe is product of Reinforced Laminates, Inc., Dept. CP, 3040 East Hennepin Ave., Minneapolis 13, Minn. . . or check CP 2572 on form opposite last page.)

**Covers corrosion-resistant,
ductile nickel-iron**

Ductile nickel-iron, an engineering material that combines the strength and ductility of ductile cast iron with resistance to corrosion, heat, and wear possessed by Ni-Resist castings, is covered in four-page bulletin.

Bul 3114-DI-27 is issued by The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N.Y. Specify CP 2573 opp. last page.



KEL-F® dispersion-coated tank truck transports corrosive chemicals



BAKE OVEN at Kellogg Plant, Jersey City, N. J. Overall length 85 ft., width 12 ft., height 12 ft., iso-thermal control, $\pm 5^\circ\text{F}$. This new Kellogg oven is being used to develop improved techniques for large area applications.



QUENCHING—After final baking, tank is quenched to produce tough, transparent, flexible coating.

This tank, which is designed to transport corrosive chemicals without danger of contamination of the final product, was spray coated with KEL-F Dispersions at the Kellogg plant in Jersey City, and baked-fused in a specially built oven large enough to complete each coating in a single operation. Preliminary tests were carried out with a slightly smaller tank, and the correct techniques developed before proceeding with the coating operations on the tank truck.

KEL-F DISPERSIONS—NEW WEAPON IN FIGHT AGAINST CORROSION

KEL-F Dispersions are finely divided fluorocarbon plastic solids in a volatile medium. Applied by spray, dip or spread coating, they are fused by heat into a tough, impervious coating—firmly bonded to the surface on which applied, and providing a chemical and temperature resistant surface that is anti-sticking and self-cleaning.

This liquid chemical carrier is evidence that the range of applications for KEL-F Dispersions is not limited by size, and that present techniques of dispersion coating can be applied to tanks and other outsize equipment. There are experienced applicators of KEL-F Dispersions, serving nearly every major industrial area. They can show you how this fluorocarbon polymer can come to your aid in your fight against corrosion and high processing temperatures. For more information, send for KEL-F Dispersion Manual, and list of applicators.



THE M. W. KELLOGG COMPANY
Chemical Manufacturing Division, P. O. Box 469, Jersey City, N.J.
SUBSIDIARY OF PULLMAN INCORPORATED

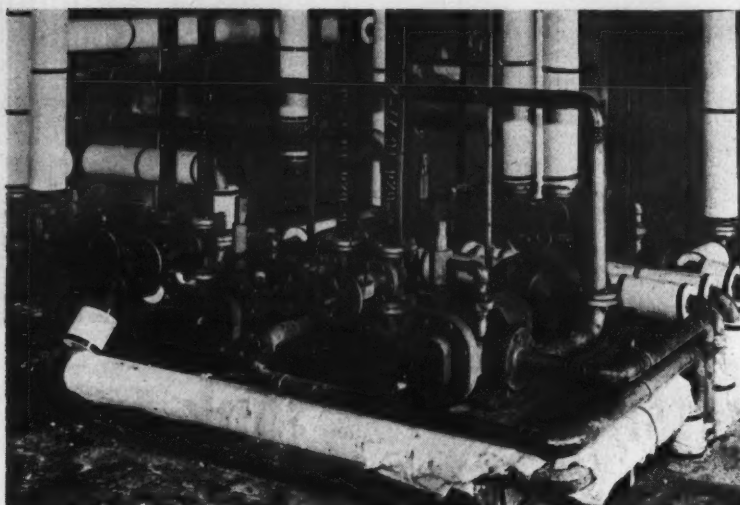
® Registered trademark of The M. W. Kellogg Company's fluorocarbon polymers

When inquiring check CP 2574 opposite last page

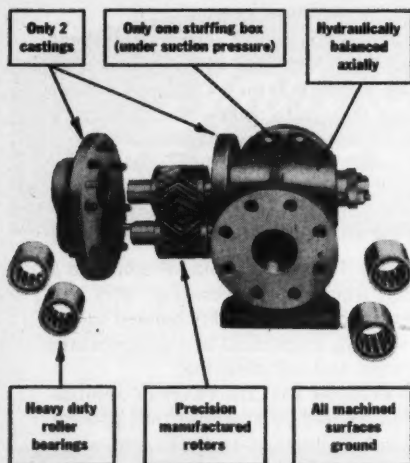
PUMPING CORROSIVE CHEMICALS? *Get low-cost, high-capacity pumping with . . .* **Sier-Bath**

Shown below are six Hydrex Pumps at the General Electric Company, Schenectady, N.Y., used for unloading tank cars and transfer pumping of Diallyl Phthalate, Melamine, Soya Fatty Acid and Formalin. Model 2½ C-5 Hydrex Pumps shown have type 2A Ni-Resist body, bearings and packing glands. Shafts are of Type 316 stainless steel.

HYDREX® PUMPS



Sier-Bath HYDREX PUMP



The simplest heavy duty gear pump made! Use it in place of pumps costing much more . . . for handling chemical solutions, fuel oils, lube oils, hydraulic liquids, etc.

The "Hydrex" needs no costly speed reducer—can be direct-connected up to 1800 RPM. Extreme simplicity allows heavier construction, easier installation and maintenance, less downtime, longer life.

Models available to pump liquids from 32 SSU to 250,000 SSU, at 1 to 350 GPM, up to 500 PSI. Call your local Sier-Bath Pump Representative . . . write to **Sier-Bath Gear & Pump Co., Inc.**, 9260 Hudson Blvd., North Bergen, N. J.

Sier-Bath ROTARY PUMPS



50th Anniversary

Mfrs. of Precision Gears, Rotary Pumps, Flexible Gear Couplings

Member A.S.M.E.

When inquiring check CP 2575 opposite last page

CORROSION

Blacktop now coated green or red . . .

serves as protective sealer, improving appearance

Uses: As a coating and surface sealer for bituminous concrete.

Features: Material is now available in three colors — charcoal, green, and red. Thus, it improves appearance as well as protecting blacktop parking lots or Portland cement concrete floors.

Description: Surface sealer is a pitch emulsion that is insoluble in oils and gasoline. It has good resistance to acids and alkalis and a variety of chemicals. Coating can be quickly applied and dries in a few hours. On exterior paving, sealer prevents cracking and penetration of water which causes breaks.

(Meco surface sealer is a product of Maintenance Engineering Co., Dept. CP, 16 W. Johnson St., Philadelphia 44, Pa. . . . or for more information check CP 2576 on form opposite last page.)

Progress report on titanium

Mechanical properties of both alloyed and unalloyed grades of titanium and comparative properties of other pure metals are given in eight-page progress report. Methods of forging, annealing, rolling, descaling, and pickling titanium sponge in primary fabrication are discussed.

Sheet forming, machining, grinding, sawing, and joining of titanium in secondary fabrication are also covered. A number of photographs show uses for the metal in chemical and other industries.

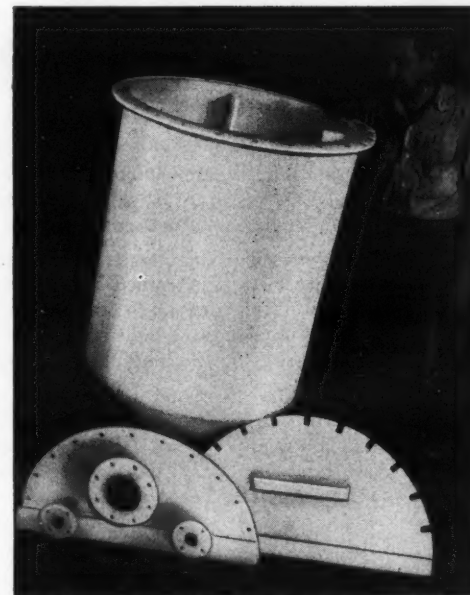
"Titanium Progress Report #2" is issued by Pigments Department, E.I. du Pont de Nemours & Co., (Inc.), Dept. CP, Wilmington 98, Del. When inquiring check CP 2577 on form which is located opposite last page.

agilene®
(POLYETHYLENE)

agilide®
(NON-PLASTICIZED)
(POLYVINYL CHLORIDE)

improved non-corrosive plastics for fabrication of chemical processing equipment

Agile's high-grade modern thermoplastic construction materials—AGILENE and AGILIDE—fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



For inorganic corrosion problems at temperatures up to 170°F.—specify AGILENE. AGILENE tanks are available built to your specifications or in standard sizes, rectangular and cylindrical. The photo shown above is a 50 gallon acid make-up tank for 40% hydrofluoric acid, complete with flanged nozzles and interior details to customer specifications.

American Agile Corporation

Plant and General Offices • 3461 Durham Rd., Maple Heights, Ohio
Mailing Address: P. O. Box 168 • Bedford, Ohio

DEPT C-1

When inquiring check CP 2578 opposite last page

CHEMICAL PROCESSING

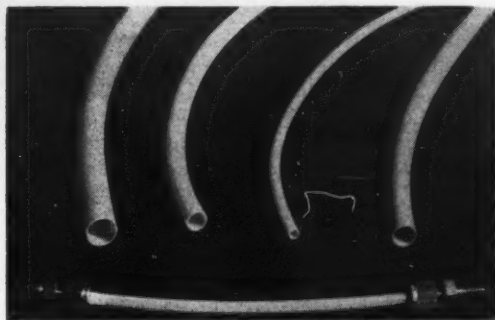
No contamination results when Teflon tubing is used . . .

flexible material is inert to chemicals and strong solvents

Uses: In chemical, petroleum, pharmaceutical, and food industries for fluids that are difficult to handle.

Features: Flexible tubing operates from 29 inches of mercury vacuum to 100 psi pressure. Its service temperature range is from that of liquid oxygen ($< -183^{\circ}\text{C}$) to $\pm 500^{\circ}\text{F}$.

Description: Teflon flexible tubing is extruded in sizes from $\frac{1}{8}$ to 1" ID, and standard wall thick-



Pressure range of tubing is 29 inches Hg vacuum to 100 psi pressure

ness is from 30 mils to one inch. Larger tubes have heavier walls. Different wall sizes are available on request, and tubing can be supplied in all colors for identification of fluid streams. Ferrule fittings made from Monel, nickel, stainless steel, and nylon can be used, as well as Teflon fittings.

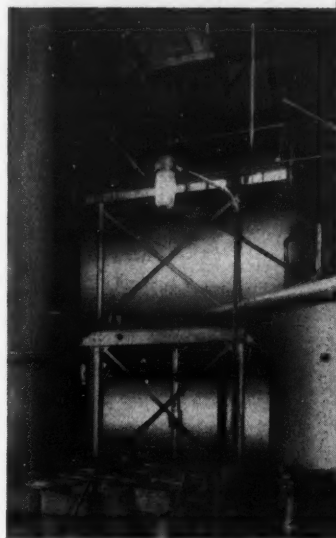
(Teflon flexible tubing is a product of Pennsylvania Fluoroplastics Co., Dept. CP, 1115 N. 38th St., Philadelphia 4, Pa. . . or for more information check CP 2579 on form opposite last page.)

Reinforced plastic pipe fittings are corrosion-resistant, tough, provide unrestricted flow

Complete line of plastic pipe fittings resists a wide variety of corrosives and are extremely tough. Fittings, which are made with thermosetting polyester resins combined with glass fiber mat and cloth, are designed with smooth interior which provides unrestricted flow of liquids. Fittings are designed for use with manufacturers testing pipe and are available in sizes from 4 through 12" OD.

(Plastic pipe fittings are products of Refin Co., Dept. CP, 5730 Kearny Villa Rd., San Diego, Calif. . . or check CP 2580 opposite last page.)

Purity is safeguarded. Under- and over-chlorinated portions are separated from 2,4-D in this equipment. To maintain purity, fractionating column is solid nickel. Tanks are Nickel-Clad Steel. Both materials are also used in other equipment for the same purpose.



his cornfield once looked hopelessly over-grown with weeds.

Now the weeds are under control. Yet not a single hoe ever touched the soil.

Give the credit to 2,4-D, an amazing chemical discovery. It destroys only broad-leaved weeds. And gives food plants like corn, wheat, rice, oats and barley a new lease on life!

Unlike older weed killers, 2,4-D is not a poison in the accepted sense. It's practically harmless to humans or animals. But it disrupts the normal growth cycle of broad-leaved weeds. In three or four weeks, they're dead.

What's 2,4-D? Actually, 2,4-dichlorophenoxyacetic acid. And there were tough problems to overcome at

nearly every stage of its development.

Corrosion, for example, was a constant threat to the life of equipment — and to the purity of the final product. So nickel and the nickel alloy, Monel®, are specified for pipes and fittings, steam coils, reactors, centrifuges, dryers, tanks and other equipment used in the making and handling of 2,4-D.

Nickel and Monel protect product purity. And they resist corrosion as few metals do!

If you have a problem in which corrosion, high or low temperatures, stresses, fatigue, or the maintenance of product purity are troublesome factors, let's talk it over. Two minds are always better than one, and we may be able to help you find out how nickel — or one of the more than fifty Inco Nickel Alloys now available — can solve your problem. Write The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.



INTERNATIONAL NICKEL

67 Wall Street New York 5, N. Y.

Nickel Alloys Perform Better Longer

Story behind the story...

Nickel and Monel hold corrosion down, give chlorinated organic high purity

If you chlorinate organics, you may find the story behind this Business Week advertisement (Sept. 24 issue) of particular interest.

When Pittsburgh Coke & Chemical Company began to make the now-famous weed-killer, 2,4-D, a number of years ago, some formidable corrosion and contamination problems soon developed.

During the chlorination, small amounts of hydrochloric acid form and some chlorine fails to react.

Both corrosives are bad for equipment. Worse for product . . . since even a little metallic pick-up adversely affects its color and purity.

Corrosion tests showed what to do

Eventually, nickel or Nickel-Clad Steel replaced other materials in the still, steam coils, fractionating tower, condenser and storage vessels.

Monel®, an Inco nickel-copper alloy, is now used for the 2,4-D reactor, the dichlorophenol weighing tank,

the stripping column, the centrifuge and dryer.

The result? Practically trouble-free operation.

If you have a corrosion or contamination problem, Inco Nickel, Monel, or other nickel alloys may prove the answer. Inco's Corrosion Engineering Section will be glad to help you look into it. Just write.

*Registered Trademark

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street

New York 5, N. Y.



MONEL® • "R"® MONEL • "K"® MONEL • "KR"® MONEL • "S"® MONEL • INCONEL® • INCONEL "X"® • INCONEL "W"® • INCOLOY® • Ni-O-NEL • NIMONIC® ALLOYS • NICKEL • LOW CARBON NICKEL • DURANICKEL®

When inquiring check CP 2581 opposite last page

Another new development using

B. F. Goodrich Chemical raw materials



B. F. Goodrich Chemical Company does not manufacture this pipe. We supply only the Geon resin.

CHECK THESE 4-WAY SAVINGS WITH RIGID VINYL PIPE

Installation time cut • Heavy machinery eliminated • Two man crew does the job • No corrosion, longer life.

Here's a hot case history of how costs were cut four separate ways by specifying plastic pipe made from Geon high impact rigid vinyl resin. The installation collects crude oil in a water flood system near Tulsa, Oklahoma.

The plastic pipe replaces 2 miles of steel pipe that failed due to salt and sulphur corrosion. A two man crew laid 640 feet of 3 inch rigid vinyl pipe made from Geon resin in an hour. No heavy machinery was used; the pipe

is so light a length can be handled by one man.

Biggest saving comes from the long life of rigid vinyl pipe made from Geon resin. It withstands rough handling, won't corrode, has better chemical resistance, and costs less than many other pipe materials.

Rigid plastic pipe is but one of many products made from Geon polyvinyl materials that show similar economies in both installation and upkeep. Sheets, valves and other products used in the petroleum and chemical industries demonstrate daily the versatile qualities of Geon polyvinyl

materials. For information on Geon materials, please write Dept. BD-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



CORROSION CONTROL

Excellent flexibility and adhesion furnished by epoxy resin protective coating . . .

withstands acids, caustic, oil and grease, and many solvents

Among a number of highly desirable properties of epoxy resin protective coating, based on Shell's Epon resins, is the excellent flexibility of the film, which never becomes brittle. Adhesion of material to glass, wood, metal, and most plastics is also excellent. Completely cured film has good resistance to many solvents, aqueous mineral acids, and strongly alkaline solutions. Immersion in a 5% caustic solution for three months at room temperature and in boiling caustic had no effect on adhesion, color, or texture of film.

No discoloration or disintegration of color occurs upon prolonged exposure to steam, most gas or acid fumes — conditions found in many chemical plants. Coating stands up well under abrasion and withstands dry heat up to 400°F without discoloration. When cured, film is non-flammable, non-toxic, and has no odor.

(Epo-Lux protective coating is product of Steelcote Mfg. Co., Dept. CP, 3418 Gratiot St., St. Louis 3, Mo. Check CP 2583 opposite last page.)

Cathodic protection aided by assembly technique for anodes . . .

can be fixed on cable exactly where needed

Uses: For impressed-current cathodic protection. Although anodes were developed for installation in cable ducts, they can also be used to advantage in ditches to protect parallel bare pipe runs.

Features: Assembly technique for recently developed graphite anode fixes the anode exactly where it is needed.



For improved cathodic protection

Description: Graphite anode assembly setup has virtually no limitation to size, type or length of cable. Units are light and easy to handle and not subject to breakage in shipping. Anodes are economical to install and have low circuit resistance. They are attached by crimp connectors.

(Type QA graphite anodes and assembly are product of National Carbon Co., Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Check CP 2584 opposite last page.)

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.
GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

When inquiring check CP 2582 opposite last page

Want to forget about rust for 20 years?



Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without any further maintenance.

These unique coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Why not find out more about how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 62-B—it's free.

the Metco* Systems

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment in a wide range of corrosive conditions. The *Metco Systems* provide for standardization of surface preparation, coating thicknesses and organic aftercoatings for various surface conditions and appearance requirements.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.

See other examples of metallizing in Sweet's File for Plant Engineers Section 7a/Me



Metallizing Engineering Co., Inc.

1143 Prospect Ave., Westbury, L. I., New York • cable: METCO
In Great Britain:
METALLIZING EQUIPMENT COMPANY, LTD.—Chobham near Woking, England

DON A. WATSON METALLIZING ENGINEERING CO., INC.

1143 Prospect Ave., Westbury, Long Island, N. Y.

- ☐ Please send me, without obligation, Bulletin 62-B.
☐ Please have Metco Field Engineer call.

NAME _____

COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

When inquiring check CP 2585 opposite last page

CORROSION

**Will not warp, rust;
resists alkalis
and acids . . .**

reinforced glass fiber panels
now in nine-foot lengths

Uses: Construction of walls, partitions, and work tables, or even whole rooms.

Features: Panels will not warp or rust. They will resist up to 50% concentrations of sulfuric acid at temperatures up to 200°F, 40% concentrations of hydrochloric acid up to 250°F. They can be used with gasoline and

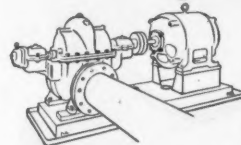


Panels are available either translucent or opaque

fuel oil in concentrations up to 100% at temperatures to 200°F.

Description: Now available in 9-ft lengths, units can be made self-extinguishing. A superior insulator, they do not suffer from attacks of vermin or fungi. Panels are smooth-surfaced and easy to clean and are available either translucent or opaque in a wide range of colors including white and natural.

(Lamcor panels are a product of Strick Plastics Corp., Dept. CP, 31-06 38th Ave., Long Island City, N.Y. . . . or for more information about this product reader may simply check CP 2586 on convenient Reader Service slip located opposite last page.)



easily installed in split-case pumps

This new addition to the "JOHN CRANE" family of anti-corrosive Type 9 Seals is the answer to a simplified means of seal installation (or removal) in modern split-case pumps.

Need for unbolting the upper half of the casing is eliminated, since the unit is mounted on a sleeve with an outside clamping ring.

Sealing members of DuPont Teflon readily adapt this seal to the handling of chemicals, solvents and corrosives, plus high temperature and similar conditions under which rubber cannot be used.

Springs and metal parts are furnished in the metallurgical specification best suited to the service.

Wherever "hard-to-handle" liquids or gases are involved . . . temperatures from -90° to +485°F . . . pressures to 750 psi . . . the "John Crane" Type 9 Seal is the seal for your pump.

Get complete facts and engineering data on the "John Crane" Type 9 Packaged Seal with outside clamping ring. Contact Crane Packing Co., 1821 Cuyler Avenue, Chicago 13, Ill. In Canada: Crane Packing Co., Ltd., 617 Parkdale Ave., N. Hamilton, Ont.

*DuPont Trademark



CRANE PACKING COMPANY



When inquiring check CP 2587 opposite last page

Jumping thru a hoop for you is our business

● When you want such information as delivery, price and other details on an inquiry or order, you want it quickly. Damascus makes a point of quoting the same day. Many times a "same-day" quote means literally jumping through a hoop. But, good service is a sound way to obtain going business, so we give good service. Phone, wire or write Damascus about your stainless steel tubing needs for same-day quote.

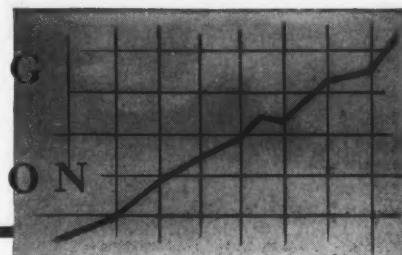


Ask us... DAMASCUS

DAMASCUS TUBE COMPANY
STAINLESS STEEL TUBING AND PIPE
Greenville, Pennsylvania

When inquiring check CP 2588 opposite last page

EXPANDING CHEMICAL PRODUCTION



Enlarge ethanolamines unit at Seadrift, Texas

Carbide and Carbon Chemicals Company will more than double its ethanolamines capacity with completion of a new unit at Seadrift, Texas. Plant is a major installation for production of ethylene oxide, ethylene glycol and butadiene. New ethanolamines unit, to be completed in the fall of 1956, will be fully integrated with these facilities.

Plans wide expansion program in detergent field

Expansion program in liquid detergent field is being initiated by General Aniline & Film Corporation. Antara Chemicals Division will get new facilities in Kentucky, New Jersey and on the West Coast. A new surfactants manufacturing building will be constructed at Calvert City, Kentucky. Additional facilities will be installed at the present plant in Linden, N.J. Large storage tank facilities will be leased in Los Angeles and Alameda, Calif. Calvert City operation will be adjacent to the new acetylene products plant.

Picks Georgia location for new mill

Rayonier Incorporated will build a chemical cellulose plant at Jesup, Georgia. Cost will be approximately 25 million dollars. Annual capacity will be 100,000 tons. Reason for expanding production so soon after putting present Jesup mill in operation (June, 1954) is increased demand for rayon, acetate, tire cord, cellophane.

Davison Chemical enters field of liquid fertilizers

Davison Chemical Division of W. R. Grace & Company will build a plant for manufacture of liquid fertilizers at Wakarusa, Indiana, 18 miles southeast of South Bend. Plant and its associated marketing activities are projected as a developmental operation on a comparatively large scale as the plant will have a capacity of fifteen tons of liquid fertilizer per hour.

Main purpose of the operation will be to serve as a focal point of a program for expansion of liquid fertilizer markets. Wakarusa was chosen because the area has a wide variety of farming nearby — grain, vegetable, fruit and livestock. Davison believes that significant expansion of liquid fertilizer market will occur. New plant is expected to furnish information on the direction this expansion will take.

Five-million dollar plant for molding compounds

Five-million dollar plant for phenolic molding compounds was brought into production at Kenton, Ohio, by the Durez Plastics Division of Hooker Electrochemical Company. Plant will specialize in long uninterrupted production runs of the largest volume compounds in the Durez line. This will enable the main Durez plant at North Tonawanda, N.Y., to concentrate more intensively upon manufacture of phenol and formaldehyde, various phenolic resins and on special molding compounds produced in smaller lots. Kenton, Ohio, was selected because it is in the geographical center of Durez's midwestern market and has adequate water and power.

**News about chemical materials in the US —
plant construction, increased production . . .
on stream now or planned for future**

**Dow producing soda ash
at Freeport, Texas**

Commercial production of soda ash at Dow's three-million dollar plant at Freeport, Texas, has started. Production capacity is 300 tons per day. Plant uses Dow Chemical's own process which differs from the Solvay process. Research on the new process was begun in 1945.

**National Starch doubles capacity
of polymerization plant**

Increased demand for vinyl acetate resin from paint, adhesive, textile and paper industries is causing National Starch Products Inc. to double the capacity of their new plant. Plant is located at Meredosia, Illinois.

**4000 bpsd fluid coking unit
for Bakersfield refinery**

Detailed engineering has been started to construct 4000 bpsd fluid coking unit for Bankline Oil Company at Bakersfield, Calif. Unit will convert crude and thermally-cracked fuel oil to gasoline, gas-oil, gas and petroleum coke.

**Cincinnati area demands
more sulfuric acid**

Steadily increasing demand for sulfuric acid by industries in the Cincinnati area dictated Du Pont's decision to build another acid plant there. Construction is to start immediately. This plant will start operations in the latter part of 1956. New facilities will replace the Grasselli Lockland Works.

**Non-electrolytic process
for hydrogen peroxide**

After operating a non-electrolytic process for five years in pilot plant, Columbia-Southern Chemical Corporation is going into commercial production of hydrogen peroxide. Engineering on the new plant is underway.

**Electrolytic production
of caustic potash**

Pennsylvania Salt Manufacturing Company has started construction for production of potassium hydroxide. Process will use DeNora mercury cells and will be continuous. Plant is to be located at Calvert City, Kentucky works.

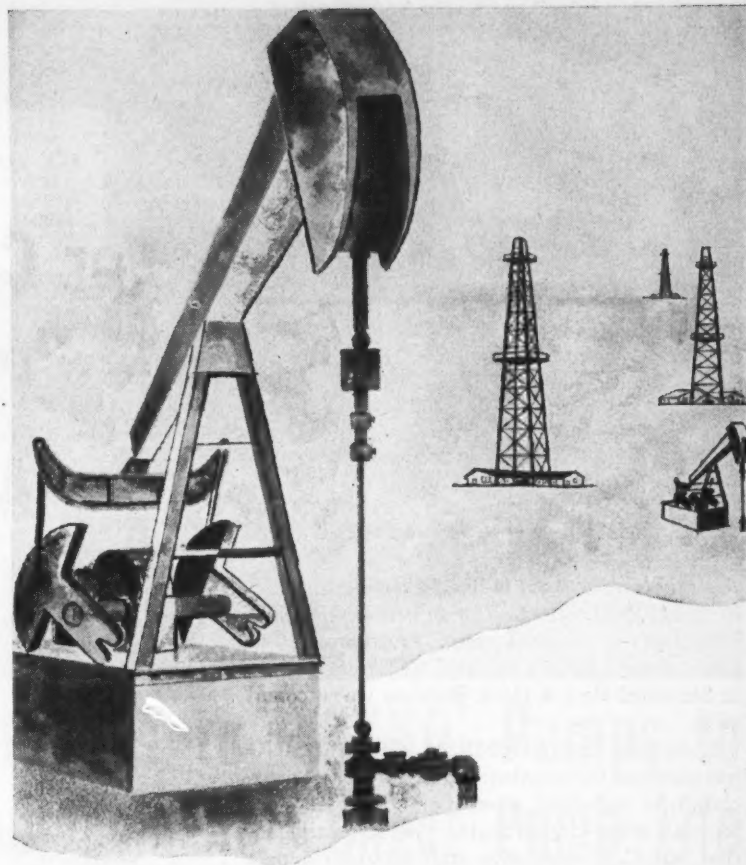
**Will expand copolymer plant
by additional 22%**

Copolymer plant near Borger, Texas, of Phillips Chemical Company will be expanded by 22%. . . in addition to 15% already announced by the company. Production capacity of the adjacent Plains butadiene plant will also be increased to provide additional butadiene used by the copolymer plant. Construction of the new facilities will begin immediately. Completion is expected during the first quarter of 1957.

Still more rubber

Goodyear Tire & Rubber Company is doubling Akron, Ohio, plant capacity for nitrile rubbers and latices. Expansion is part of the 100-million dollar program recently announced by Goodyear. The new plant will cost about 3½ million.

(Continued on next page)



**AMPCO* METAL quadruples life
of polished rod liners**

**Critical part sets new records in tough oil-well service, thanks to
Ampco Metal's remarkable corrosion- and sliding-wear resistance**

In oil well pumping the 14 to 16-foot polished rod liner really takes a beating. As you can imagine, sliding wear, in this extra-long bushing, is a real problem when you consider the number of strokes made by a pump during an operating day. Corrosion enters the picture, too, with the liner often in contact with salt water, sulfides, etc.

With ordinary bronzes, Cities Service Oil Company found frequent replacement to be a constant headache. Then, in certain areas, it switched to liners made from Ampco Metal Pipe. Cities Service engineers report a substantial reduction in liner replacements.

Ampco Metal Liners last four times as long as plain bronze liners because they are made from a unique aluminum bronze alloy. It's a remarkable bearing material—has unusual resistance to mechanical wear. It withstands the corrosive effects of many acids and caustics. And when used as pipe it combats erosion from solids held in suspension.

Ampco pipe and tubing is available in all sizes, along with a complete line of flanges and fittings. Write today for full information.

*Reg. U. S. Pat. Off.



AMPCO METAL, INC.

Dept. CP-12

Sole Producer of Genuine Ampco Metal

Main Office and Plant
Milwaukee 46, Wisconsin
West Coast Plant
Burbank, California

PR-20

When inquiring check CP 2589 opposite last page

"Plus Sign"

for Chemical Processing Advertisers[★]

The emblem at right is that of NBP—National Business Publications. You've probably seen it before on our contents page . . . rate card . . . or heading the **CHEMICAL PROCESSING** listing in Standard Rate & Data. Because we're proud of it.

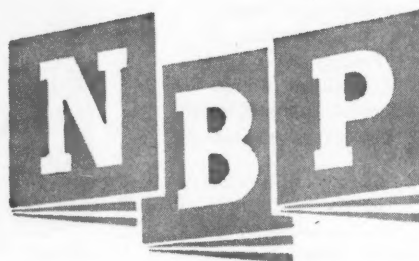
It signifies that **CHEMICAL PROCESSING** has qualified for membership in the largest association of technical, scientific and professional journals in the United States. (We're proud, too, that our C. P. executive staff includes a past president of NBP and a member of its Board of Directors.)

But belonging to NBP is more than a feather in our publishing cap. It's an important *plus* for every advertiser in **CHEMICAL PROCESSING**. Here are the membership requirements. Judge for yourself:

- Unbiased editorial content
- Periodic reader interest evaluation
- Non acceptance of questionable advertising
- Periodic audit of circulation
- Uniform rates to all advertisers

In addition, NBP provides the framework for a continuing exchange of ideas among member publishers. The result: continuing improvement in publishing practices to make **CHEMICAL PROCESSING** more useful to its readers . . . more productive for its advertisers.

[★] Courtesy of the publication **MEDICAL ECONOMICS**, creator of this copy, here adapted to **CHEMICAL PROCESSING**.



Chemical Processing

For men who manage
the Chemical Processing Industries

Published by Putman Publishing Company

Creators of **PUTMAN-STYLE** Magazines
— terse, vital editorial; "hand-picked" circulation;
— square, high-visibility format; quality readership;
— hence more **READER ACTION**



EXPANDING CHEMICAL PRODUCTION

(Continued from preceding page)

More ammonia fertilizer for Savannah

With construction starting this fall, Southern Nitrogen Company's petrochemical ammonia plant should be in operation near Savannah, Georgia by the end of 1956. Cost is figured as \$14 million.

Southern Nitrogen points out that this will be the first synthetic nitrogen plant located within market area of the South Atlantic states. By producing this near the consumer, savings of about \$3 million annually will be shared by fertilizer companies and farmers.

More than 3½ billion cubic feet of natural gas will be consumed annually to reach rated output of 250 tons of ammonia a day. Payroll will reach about \$1 million — with 200 people employed.

Para-cresol production upped 3 million lb

Hercules Powder Company announced that its Gibbstown plant is due for additional facilities to make three million pounds of p-cresol. Construction is starting and operation is slated for this time next year.

While p-cresol has not been made at Gibbstown, Hercules has been supplying about one million pounds a year from the Hattiesburg, Miss. plant. Para-cresol is the sixth product for oxychemical production methods. Others: phenol, acetone, cumene hydroperoxide, diisopropylbenzene hydroperoxide, para-menthane hydroperoxide.

More vinyl acetate is on the way

Union Carbide and Carbon Corporation will more than double vinyl acetate output from Texas City in a "multi-million dollar" expansion. Made by reacting acetic acid and

News about chemical materials in the US—plant construction, increased production . . . on stream now or planned for future

acetylene, vinyl acetate is used as a monomer and co-monomer in polyvinyl resins. Acetate can be hydrolyzed to polyvinyl alcohol for use in resins, too.

Dewey & Almy boost vinyl acetate

In line with increased polyvinyl acetate demand, Dewey & Almy Chemical Company division of W. R. Grace & Co. is doubling production. Increases are to be made at both Cambridge and Acton, Mass.

Demand increase appears to have been led by paint makers who use the material in water-based coating. Increases are also being felt in adhesives and textile sizings.

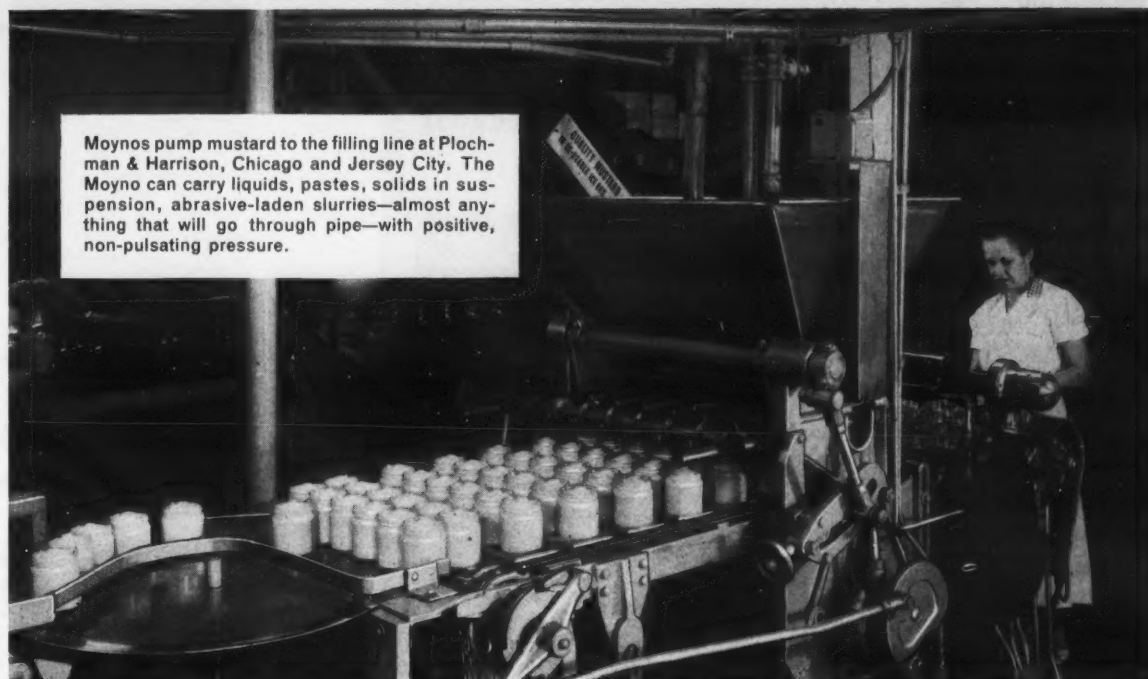
To specialize in compounds for textile application

United States Rubber Company's new latex compounding plant at Gastonia, N.C., will specialize in materials for textile use. It will produce hundreds of natural and synthetic compounds for locking loops in place, giving "hand" to cloth providing wet strength, and so forth.

New plant, comprising 30,000 square feet of work space, occupies eight acres near U. S. Rubber's textile plant. It reflects a demand increase of 150% since 1948.

More sodium to come from Ashtabula

Titanium sponge demands for sodium are to be met by increasing production at U. S. Industrial Chemical's Ashtabula, Ohio, plant. User Union Carbide has contracted for the sodium and will use it to get its Electromet plant in production (7500 tons) next summer.



Moynos pump mustard to the filling line at Plochman & Harrison, Chicago and Jersey City. The Moyno can carry liquids, pastes, solids in suspension, abrasive-laden slurries—almost anything that will go through pipe—with positive, non-pulsating pressure.

Mustard Mill Changes to MOYNO® Pumps to Get Positive Displacement, Longer Pump Life

A Moyno Pump installation at Plochman & Harrison, makers of the famous Premium Brand Mustard, illustrates the outstanding performance of the Moyno Pump. They have been pumping mustard to a filling line with the Moyno for over two years without a single replacement of parts. They are replacing other pumps with Moynos.

The mustard is pumped as a semi-solid. In addition, it has both an acid and an abrasive content which causes other pumps to wear out in a few months. Moynos handle a wide variety of products that are not pumpable with other types of pumps. These include potato salad, chow mein, fruit, acid, alkalis, pastes, abrasive slurries, paints, tar, cement, plaster, many others.

The Moyno has a unique rotor and stator arrangement which forms sealed progressing cavities that move the material, providing positive displacement. For this mustard handling job parts were made of stainless steel to assure trouble-free service and long pump life. Rotor and stator are available in other alloys, or plastic compositions.

Note the outstanding features of the Moyno shown at the right. Perhaps your pumping problems can be solved with the Moyno. Write us today! Ask for a free copy of Bulletin 30-CP. It will give you complete facts!

Features of the MOYNO that may solve YOUR pumping problem

Gentle: no churning; won't break up semi-solids . . . won't aerate liquids. May be used for metering.



Reversible: pumps with equal efficiency in either direction.

Trouble Free: self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

Positive Displacement: Moynos are available to pull up to a 29" vacuum while discharging under pressure. Big Moynos deliver up to 500 g.p.m. Pressures to 600 p.s.i. plus are available.

ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO • BRANTFORD, ONTARIO



Fractional and Integral HP Motors



Household Fans



Hoists and Cranes



Large and Small Moyno Pumps

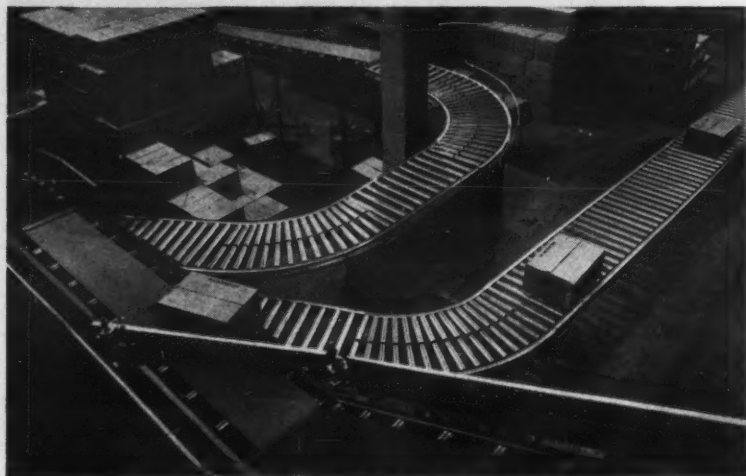


Propeller Industrial Ventilating Equipment

When inquiring check CP 2590 opposite last page

Ask Standard

*how to
cut costs with
conveyors*



Order picking is expedited and simplified by this Standard system of roller and belt conveyors in large warehouse.

Roller and belt conveyors ease warehouse traffic jams

FAST flow of goods and simplified labor add up to more profitable warehouse operations.

Standard offers a wide variety of gravity and powered, permanent and portable conveyors — that can help you establish smooth, more profitable warehousing.

Spend a few moments with a Standard engineer. He'll show you how in-

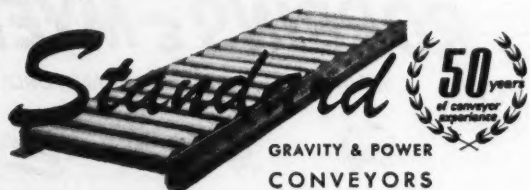
expensive Standard conveyors give you maximum flexibility at minimum cost. He'll show you, too, how Standard conveyors provide the many advantages of a custom-designed system at low cost. For the name of your nearby Standard engineer write STANDARD CONVEYOR COMPANY, General Offices: North St. Paul 9, Minn. Sales and Service in Principal Cities.



(LEFT) Belt-booster in a gravity roller conveyor "order picking" line. (RIGHT) Lift or lower floor-to-floor with an INCLINEBELT. Available in a wide range of heights and belt widths.



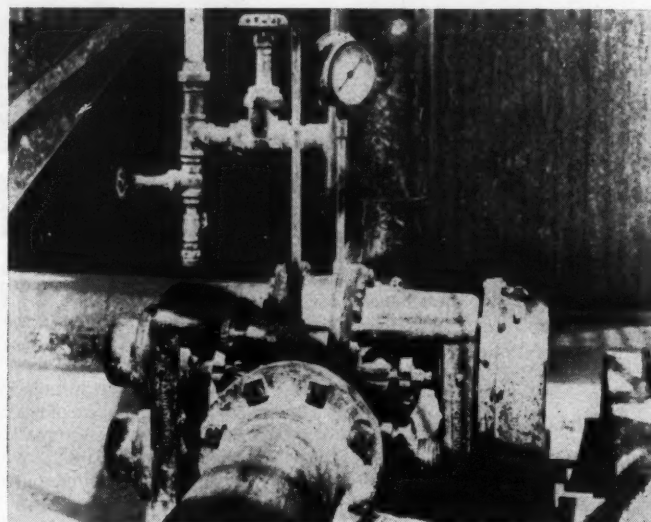
Write for Bulletin. 309-CP. Better still, contact the Standard engineer listed in your classified phone book.



When inquiring check CP 2591 opposite last page



Some idea of consistency of this 55% slurry can be had from performance of this screw conveyor carrying it from vacuum filters to collecting tank



From collecting tank it enters this pump (at rear), emerges at 60 psi and 100 gpm through six-inch line



Looking down into tankcar manhole: Line necks down through reducing T, bushings, nipples — jet at right is 55% slurry streaming to end of tankcar

material handling

At Moss Landing, California, Kaiser Aluminum and Chemical Corporation makes magnesium hydroxide — a prizewinner at being tough to handle. A gluey, viscous slurry, this material was hard to move . . . and if not kept moving, settled out to become even stickier

Pumping slurry slashes Kaiser's loading time . . . and turns out superior product

BEFORE ▶

Tankcar loading by "dump and bump" took 48 hours

Slurry settled in transit, customer had to dilute

AFTER ▶

Tankcar now loaded in steady stream.
Time: 1 1/4 hours

Slurry handles as homogenous cream
— though analysis is unchanged

By **BRUCE FADER**, Associate Editor
with **J. D. MOORE**, Superintendent
Kaiser Aluminum & Chemical Corp.
Moss Landing, California

Problem: Prior to December of 1953, Kaiser Aluminum & Chemical Corporation's Moss Landing plant in California faced a constant headache in loading magnesium hydroxide slurry into tankcars.

This gluey material came from a vacuum filter, dropped into a screw conveyor, and fell from screw's discharge into the waiting tankcar. Guided by a fall-out pipe from screw to tankcar, the slurry piled up under car's manhole. When this mound reached car's opening flow was stopped. Tankcar was then bumped back and forth to level the mound so that another could be dumped in. By repeating this process an 8000-gallon car could be loaded in about 48 hours.

But troubles didn't stop there. Once loaded, slurry began to settle. By the time car had arrived at its destination, water had collected as a top layer and lower

part of the car was a sticky mass. Unloading called for dilution and mixing — almost as much trouble as loading.

Solution: Plant management and the engineering department put their heads together to see what could be done to make the slurry behave. Among their schemes was the idea of moving slurry with a positive displacement pump. Tests were started.

For this work, they selected a "Heliquad" pump. Operating like a gear pump, this unit had two important differences from conventional gear pump designs. First, power was transmitted from one pump shaft to the other not by rotors themselves, but by external timing gears. Second difference, hinging on these external gears, was that rotor could be designed strictly for pumping. This permitted pump to maintain high throughput, head, and suction.

Pump was designed for handling viscous materials (though it does a creditable job with lightweights like gasoline, too) which are not self-lubricating. Coarse, highly pitched herringbone rotors are used. This rotor design retains the positive displacement advantage of a gear pump — but

(Continued on next page)



Why, in one year, 73 companies paid 28% more for this Baker Gas Truck

The Baker Gas-O-Matic introduces a revolutionary new concept in automatic transmissions for gas-powered fork lift trucks. Instead of a torque converter, it employs a variable voltage generator—integral with the gasoline engine—and an electric motor. The initial cost of this truck is about 28% higher than conventional clutch-type gas fork trucks. But . . . operating and maintenance costs are extremely low—in line with the higher priced battery-powered electrics. Moreover, frame, uprights, steering assembly, drive axle, etc.—in fact 90% of Gas-O-Matic's components—are standard Baker electric truck parts which always last 10 years or more.

Gas-O-Matic users have proven that

1. Fuel savings, originally estimated by our engineers as 40%, are actually in excess of 50% over ordinary gas trucks.
2. Depreciation costs are less because truck can be amortized over 9 years instead of 5.
3. Maintenance costs are less—no clutch or transmission to wear out and replace—30% fewer moving parts—no complicated electrical system—engine operates at controlled optimum RPM.

Write for
complete information
about this unusual
fork lift truck.

These Gas-O-Matic customers recognize the "lower-first-cost" fallacy—many of them have re-ordered for the second and third time—based on their experience with these trucks.

**THE BAKER-
RAULANG CO.**
1208 WEST 80TH STREET
CLEVELAND 2, OHIO

A SUBSIDIARY OF OTIS ELEVATOR COMPANY

5 GE-1

Baker

handling equipment

When inquiring check CP 2592 opposite last page



LO-VEYORS

DO MORE THAN CONVEY BULK MATERIALS

They SCALP, SCREEN, SORT, WASH, DRY, HEAT, COOL, SIZE and SCALE, while material is being conveyed. The versatility of the open pan, closed pan and tubular types makes them highly adaptable to the varied continuous processing operations.

Ajax Vibrating Lo-Veyors are compact and self-contained. Pan and drive float on springs. Easily installed on or under floors, suspended from walls or ceilings. Readily relocated since no heavy anchorage is required.

Write for Bulletin 39



Open Pan Lo-Veyor

Closed Pan Lo-Veyor

Tubular Type Lo-Veyor

AJAX FLEXIBLE COUPLING CO. INC.

REPRESENTATIVES IN PRINCIPAL CITIES

WESTFIELD, N. Y.

When inquiring check CP 2593 opposite last page

ONE MAN CAN SPOT UP TO 6 LOADED CARS... with S-A CAR PULLERS

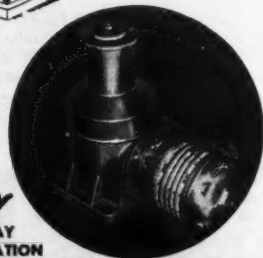


Save time, men and money with a powerful S-A Car Puller. One man operation spots cars quickly and easily... eliminates costly delays.

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IN STOCK FOR IMMEDIATE DELIVERY
WRITE TODAY FOR COMPLETE INFORMATION

VERTICAL OR
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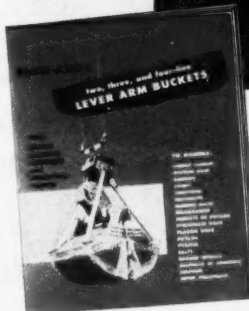


STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON

11 Ridgeway Ave. MFG. CO. Aurora, Illinois

When inquiring check CP 2594 opposite last page

How to PREVENT CONTAMINATION in your MATERIALS HANDLING OPERATIONS



Send for This Bulletin
about **BLAW-KNOX
TIGHT-LIP BUCKETS**

BULLETIN 2378 tells how the "tight-lip" construction of Blaw-Knox Chemical and Fertilizer Buckets prevents costly contamination caused by leakage of granular fines.

Blaw-Knox Buckets are designed with proper distribution of weight for maximum performance based on many years of intimate experience in the handling of various bulk materials in the chemical and fertilizer fields.

The wide range of available models permits a selection of the proper size, weight and type bucket to fit your installation requirements and obtain peak performance. Write for Bulletin 2378 today!

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
Pittsburgh 38, Pa. • Offices in Principal Cities



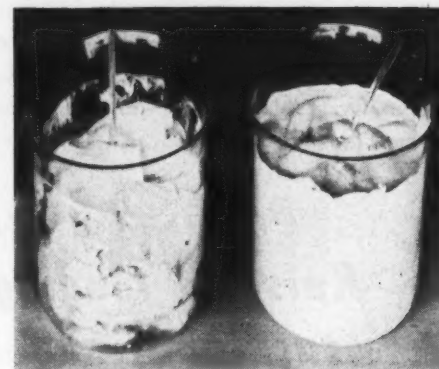
BLAW-KNOX CLAMSHELL BUCKETS
for the Chemical Industry

When inquiring check CP 2595 opposite last page

MATERIAL HANDLING

PUMPING SLURRY

(Continued from preceding page)

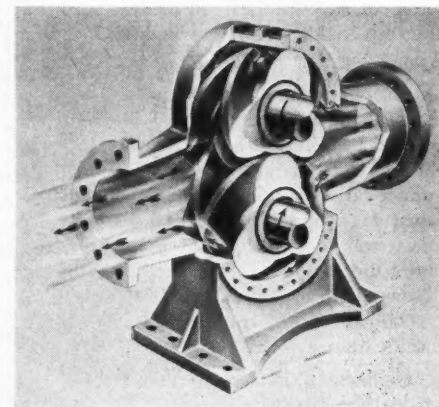


Analysis of these slurries is the same. Right sample has been homogenized in passing through pump

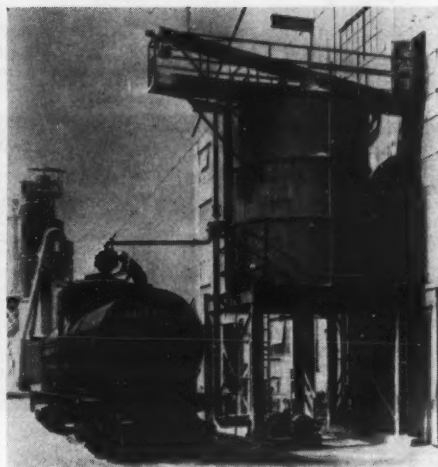
produces a steady flow without pulsations. Further, high pump suction can be attained. This has been proven by occasional plugging of pump intake at Moss Landing. A vacuum of 27 inches has been run up.

To keep pumped material out of bearings a series of labyrinth rings are used. Annular spaces between rings and housing are connected through a regulating valve to pump's intake side. Thus, whatever leakage can get through the high-resistance labyrinth is picked up and returned to intake before it reaches the bearings.

Test results indicated that slurry could be pumped despite peaks of 55% solids. More important — pumping action homogenized this slurry. This was a side effect. Pump itself is standard and was not selected with homogenization in mind. Apparently, shearing action of the rotors pulled the teeth of the formerly gluey stuff and reduced its consistency to a point where it could be squirted through a nozzle.



Cutaway of pump shows rotor construction. Labyrinth seals and timing gears (not shown) extend to sides



Slurry loading station at Moss Landing. Pump can be seen on ground under collecting tank

Though they had hardly hoped for such a break, Kaiser engineers were quick to follow it up. They devised a system where slurry is collected in a tank and passes through an eight-inch vertical pipe to pump's intake. Located at railside, pump delivers to a six-inch horizontal discharge line. Line pressure here is usually maintained at about 60 psi.

To do this a 15-hp motor drives the pump, through a gear reduction train, at 220 rpm.

Valves in six-inch line permit direct loading of car or recirculation to tank. Recirculation is used to thin particularly obstinate slurries.

Entering the car itself, the six-inch line necks down through a four-inch T and is further reduced with bushings to a 3/4-inch nipple at each end. Acting as nozzles, these nipples direct slurry against tank-car ends about 14 feet away.

Results: Slurry now fills tankcar from the ends in. Thus, steady flow can be maintained at 100 gpm or a little better. Instead of 48 hours, car can be filled in 1 1/4 hour — in one shot.

While this pumping job is sporadic — depending on customer requirements for tankcar shipments — pump has been in intermittent service since December 22, 1953. In that time it has maintained the same high performance. Packing glands have been tightened once or twice, but first down time for the unit was September, 1955, when impellers were replaced.

In addition to these calculable benefits, Kaiser knows that customers are better satisfied. Homogenization of the slurry makes it easier for them to unload and handle.

(HQA Heliquad pump used in this installation is made by Kinney Manufacturing Div., New York Air Brake Co., Dept. CP, Washington St., Boston 30, Mass. . . . or for more information check CP 2596 on the convenient Reader Service slip which is located opposite last page.)

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DIALED WEIGHT
SELECTION BELONGS
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THIS NEW FREE BOOK
TELLS THE FULL STORY
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for fractional proportions. Send for this free booklet today. See how a Select-O-Weigh system —developed out of Richardson's 50 years of experience in building automatic weighing, proportioning and blending equipment—can solve countless problems in your change-over from conventional weighing and proportioning methods to automation.

Write today for your free copy of Bulletin 0351.



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Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 2597 opposite last page

CONSULT FOR THE BEST
PS Materials HANDLING EQUIPMENT

DRUM AND BARREL SLING
Item B-203
\$18.50
Loading and unloading trucks and for general purpose handling. Handles drums from lying position and set on end. Handles drums, barrels, kegs—anything with a lip. Half-ton capacity. Weight opp. 8 1/2 lbs.

CARBOY TRUCK
Item B-482

BARREL CRADLE
Item B-416

DRUM and BARREL TILT
Item B-731
\$198.50
A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive. Equipped with two safety type locking devices and all-steel, welded yoke. Hand-operated chain drive.

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MULTI-PURPOSE CART
Item B-531

Combination TRUCK and DRAIN RACK
Loads Automatically
Moves barrels or drums, also serves as drain rack. Two styles—with or without detachable handles. Sturdy frame-welded construction. Weight approximately 90 lbs.
Item NS-506 (Handles welded to frame) \$5270
Item NS-506 DH (Detachable handles) \$5490

TRAILER TRUCK side dump
Item B-746

CORRUGATED BOX with legs
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BARREL TRUCK loads automatically
Item S-911

BARREL and BOX SKID
All-Steel
This new skid, although much lighter in weight and easier to handle than the old fashioned, clumsy wood skid, is made entirely of steel, welded construction and will out-last any wooden skid that was ever made. Will stand up under the heaviest barrel or box. Skid measures 14" wide overall. Attractively priced.

WHEN ORDERING always give "item" number. All PRICES are f.o.b. Detroit. Prices are subject to change without notice.

DESIGNED AND MANUFACTURED BY
Palmer Shile Co.
16016 FULLERTON AVE., DETROIT 27, MICH.

When inquiring check CP 2598 opposite last page

MATERIAL HANDLING

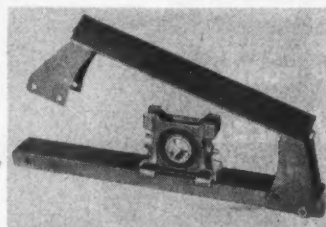
Allows easy access to bearings . . .

takeup is available with ball, roller or babbit bearings

Uses: Adjusts tension on such material handling equipment as apron, belt, chain, drag, flight and slat conveyors.

Features: Hinged top frame allows access to adjusting screw and bearing block.

Description: Takeup is available with babbitted, ball or roller bearings. Adjusting screw, never projecting beyond end of frame, can be turned from either end.



Top frame, shown in raised position, provides easy access to bearing block

Units can be furnished with spring-loaded screw or counterweights for gravity takeup. Units are available for takeups from 12 to 30".

(Model DS takeup is product of Dept. PR, Link-Belt Co., Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. . . . or for more information check CP 2599 on form opposite last page.)

Shows how to select roller conveyors

Printed in two colors, six-page booklet describes complete range of roller conveyors. Types and sizes are tabulated together with typical installations and key features.

"General Purpose Roller Conveyor" is issued by The Alvey-Ferguson Co., Dept. CP, Cincinnati 9, Ohio. When inquiring specify CP 2600 on form opposite last page.

Tractor Model KT

Platform Model KN-KW

Tin Plate Model KTP

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Look over the models illustrated. Some one of these trucks is adaptable to your needs. Whether you want to pull—push—carry or lift there is a model for every possible use. The many fleets of HYDROLECTRICS today carry products of every kind, shape and description are convincing evidence of their unusual application.

Write today for FREE Catalog No. 35 featuring complete line of Lift Trucks.

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LIFT TRUCKS INCORPORATED
2423-31 SPRING GROVE AVE
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When inquiring check CP 2601 opposite last page

Half-Gantry Crane

with EXPLOSION PROOF MOTORS

This crane exemplifies Euclid's ability to design cranes that exactly meet special needs.

It is equipped with an elevated platform to facilitate operations; also explosion air-proof motors since the crane is used to service the cylinders of a gas producer plant.

Whether you have an unusual material handling problem or a more or less common one the long, specialized experience of Euclid engineers can be of valuable service. Write for the new catalog.

Euclid Cranes The EUCLID CRANE & HOIST Co.
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When inquiring check CP 2602 opposite last page

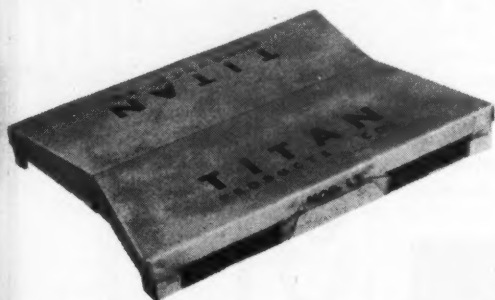
Throw-away pallet holds 1 ton — stacks 4-high

Moisture-proofed unit, delivered knocked down, assembles in 30 seconds

Uses: Palletizing of material for shipping, handling or warehousing.

Features: Made of corrugated board, unit adequately supports 2000 lb and may be stacked four-high without endangering base pallet.

Description: Pallet, delivered knocked down, occupies only 25 percent of storage space required for wooden pallets. Unit is assembled with wire



Corrugated pallet supports loads up to 2000 lb

stitching or staples. Use of pallet eliminates cost of return shipping, bookkeeping, inventory, control expenses. Pallets initially available in sizes 32 x 40" and 40 x 48". Material is fire and moisture-proofed.

(Corrugated board pallet is product of Titan Products Co., Dept. CP, 165 E. 74th St., New York 21, N. Y. . . . or for more information check CP 2603 on convenient Reader Service slip which is located opposite last page.)

How to unitize shipment with steel strapping

Printed in two colors, 16-page booklet illustrates many practical applications of steel strapping in unitizing and palletizing loads of various sorts. Examples shown apply to materials like cartons, small parts, large metal parts, and even logs.

"AIM" is issued by Acme Steel Products Div., Acme Steel Co., Dept. CP, 2840 Archer Ave., Chicago 8, Ill. When inquiring specify CP 2604 on form opposite last page.

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in handling dry materials in bulk

. . . call on

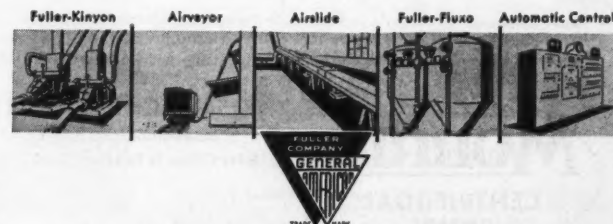
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. . . pioneers in harnessing AIR

You know, and your accountants know, that obsolescence is one of the greatest enemies of profits. The non-productive, although essential, function of materials handling can become less expensive when you install a Fuller-engineered conveying system to transport dry pulverized or granular materials in bulk, safely, efficiently and under completely sanitary conditions.

The right combination of Fuller-Kinyon, Airveyor, Airslide and Fuller-Fluxo systems installed in your plant can bring your materials handling costs down through savings in time, improved labor relations, reduced material losses and improved plant safety.

First step toward a more profitable future: Write for Fuller's informative brochure, "How to Pull Dollars Out of Thin Air." See photos of Fuller equipment on the job. Do it today.



Fuller

. . . pioneers in harnessing AIR

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GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
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When inquiring check CP 2605 opposite last page

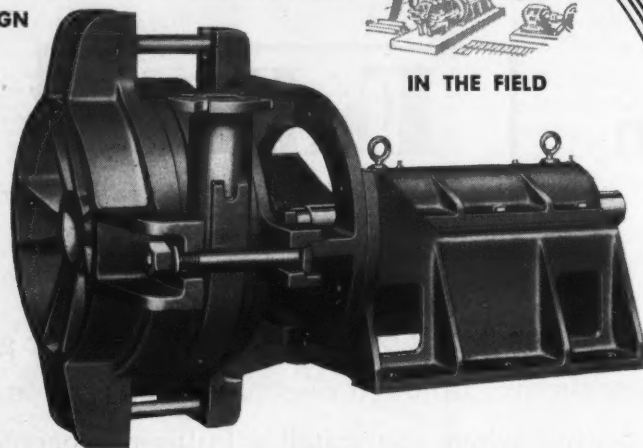
Culminating **91 YEARS** of Experience —



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10 Features Meet All Your HEAVY-DUTY Requirements!

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- Large impeller diameters
- 4-bolt construction
- Extra deep stuffing box
- Renewable impeller liners
- Shaft and impeller hub thread sealed
- Easy access to packing gland
- Adjustable rotating element to take up wear
- Thrust bearing carries normal thrust only
- Heavy outboard radial bearing for high overhung loads

THE NEW MORRIS TYPE-RX SLURRY PUMP

Outgrowth of nearly a century of pump manufacturing experience, Morris offers you two invaluable extras when you specify new Type-RX slurry pumps!

1. Full advantage of more than a lifetime of experience that Morris has had in the design, manufacture and testing of pumps.
2. Benefit from the vast experience that Morris has gathered in studying performance and efficiency records of pumps operating in every type of industry under the most severe conditions.

A few of the features incorporated in the new type-RX slurry pump are listed here to give you an idea of how we have considered your every heavy-duty requirement. When you order this new Morris pump, it will be custom-made from any one of 7 sizes, 8 metals or alloys, and 16 nozzle positions to meet your exact requirements.

For more complete information on the new Morris Type-RX Slurry Pump, write today on your company letterhead, requesting a free copy of Bulletin 185.

MORRIS MACHINE WORKS

Baldwinsville, N. Y.

Sales Offices in Principal Cities

MORRIS
CENTRIFUGAL
PUMPS

When inquiring check CP 2606 opposite last page

MATERIAL HANDLING

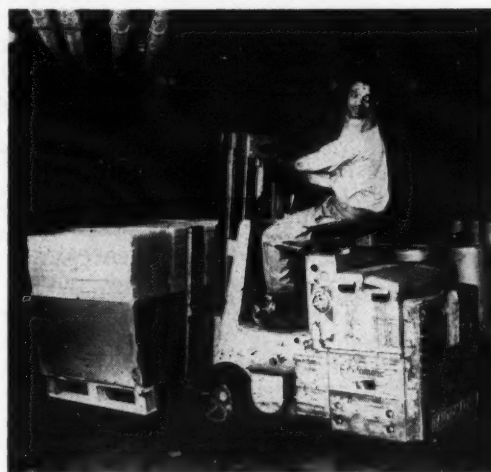
**Switch to electric truck handling
cuts handling costs 60 per cent
at paper company . . .**

overall handling time cut in half, 5 per cent gain in total plant space

In waxing and printing of paper wrappers for a large variety of food products, Waxide Paper Company of St. Louis consumes tons of bulk wax, paper roll stock, and other raw materials. All of these materials were formerly handled manually. On hot, muggy summer days, slabs of raw wax had to be chopped apart so that they could be unloaded and hand-stacked in storage. It formerly required 20 man-hours to unload and store a carload of wax. Moreover, when long periods of hot weather were experienced, venders had to ship in hard-to-get refrigerator cars.

Wax slabs are now received in palletized unit loads, either cartons or barrels, with an average of 20 pallets per car. Working in freight car, fork truck picks up 2000-lb pallet loads and takes it to an elevator 100 ft inside the plant. Here a powerized hand lift truck takes the load on to an elevator and to the basement for storage. After car is unloaded, rider-type truck is moved to storage area and stacks loads to the ceiling.

This work now takes four man hours instead of 20. Additional savings accrue by handling raw materials

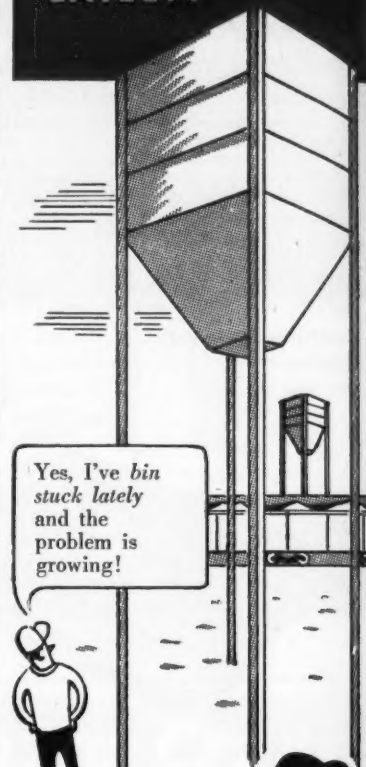


Fork truck takes palletized unit load of wax slabs from inbound freight car and transports it to storage. This method of handling has cut handling time 60%.

from stock to first processing point in unit load. This amounts to 50% saving over the piece-by-piece method which it replaced.

Large quantities of paper roll stock are also fork lifted into and out of storage. Standard rider model counter-balance electric fork lift truck has been equipped with a rotating clamp attachment. Clamp picks up the roll in the horizontal, upends it, and sets it on another. Unused air space now is being put to

BIN STUCK LATELY?



Ask Cleveland to send an engineer to recommend the right AIR OR ELECTRIC vibrator. No obligation — satisfaction guaranteed.



Literature on request.



2706 Clinton Ave. • Cleveland 13, Ohio

When inquiring check CP 2607
opposite last page

CHEMICAL PROCESSING

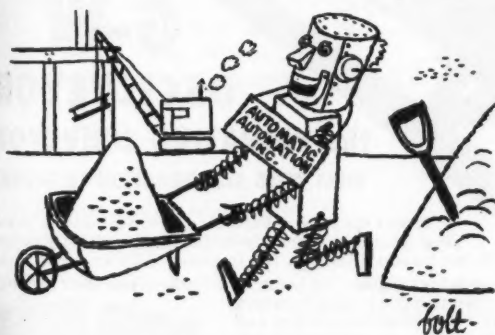
work as rolls are fork lifted and stacked three high. Complete revamping of handling procedures has resulted in a gain of 5% in total floor space. Space gain is being used for accommodating a more balanced raw material inventory and unit load storage of



Electric truck equipped with rotating clamp picks up 1200 lb paper roll, upends it, and sets it on another. Rolls are stacked three high to save space

finished stock. Not only has Waxide saved cost of renting outside storage space through this gain, but they are also saving extra handling and trucking costs which would have been involved.

(Data and pictures provided by Industrial Electric Truck Products Section of The Material Handling Institute, Inc., and Automatic Transportation Co.)



Does your plant need modern material handling methods . . . ?

check the convenient Product Directory (pages 218 to 220) for a quick reference to ideas and equipment in this issue.

LOWER COST PER TON-MILE

...yours with either a Link-Belt single belt conveyor or complete system

WHETHER you need a single belt conveyor or complete system, you'll find that Link-Belt engineering and equipment add up to lower cost per ton mile. Drawing from vast experience, our engineers can develop a system incorporating the most practical components from our complete line of quality idlers, trippers, drives, terminal machinery and other items. And if desired, we will handle erection.

Link-Belt has pioneered the development of belt conveyors for short or long hauls . . . indoor or outdoor service. To learn how this background can produce utmost economy per ton-mile in handling your bulk material, call your Link-Belt office.



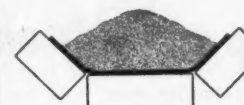
Enough chips ride this Link-Belt 36-in. wide belt conveyor to produce 250 tons of kraft paper per day. Maximum chip capacity results from use of 45-degree belt idlers.

Flat belt on flat belt idlers



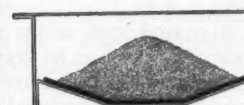
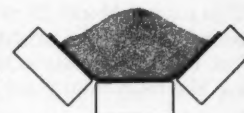
Flat belt on continuous plate

Troughed belt on 20-degree idlers



Troughed belt on 45-degree idlers with rolls of unequal length

Troughed belt on 45-degree idlers with rolls of equal length



Troughed belt on continuous plate

The load carrying capacity of belt conveyors is determined by the width of the belt, the shape of its loaded cross section, and the angle of repose of the material being carried. Link-Belt offers you one source for all belt conveyor components—including 500 idler sizes in 35 types . . . plus pulleys, drives, trippers and supports.

LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13-957

When inquiring check CP 2608 opposite last page



new Baker **SHOVELoader**

saves up to \$400 on initial cost

Now you can mechanize your bulk handling operations for less than \$10.00 per day for one year . . . much less than you pay a laborer with a hand shovel!

This rugged Model 20 SHOVELoader has a lifting capacity of 1500 pounds, and lifting height of 7 feet. Standard bucket size is 12 cubic feet. Loader arms are in front of operator—not around him—protecting him from injury and providing full 360° visibility at all times.

Four forward speeds with top travel speed of 14 MPH make this a fast machine and insure better operation on ramps and rough ground conditions.

Bucket tilt-back at ground level means a full load at every grab, and permits low carrying position for travel. Other advantages are longer forward reach, greater longitudinal stability, extremely low maintenance because of easy accessibility of all parts requiring service, and design of the husky, trial-proven engine.

Special attachments are available for special jobs—forks for palletized loads, crane hooks for hoisting, and special buckets for dense materials. Catalytic exhaust system is available for inside work, where required.

Compare these and SHOVELoader's many other features with loaders costing \$350 to \$400 more! Write for complete information. The Baker-Raulang Company, 1208 W. 80th St., Cleveland 2, Ohio.

Baker
HANDLING EQUIPMENT

When inquiring check CP 2609 opposite last page

MATERIAL HANDLING

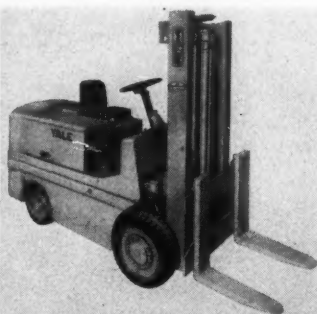
Torque drive eliminates manual shifting . . .

industrial trucks built in capacities from 3000 to 8000 pounds

Uses: In-plant handling of various palletized materials.

Features: Trucks use torque transmission—providing matched power response to varying power demand. Transmission multiplies torque in continuously variable ratio rather than in discreet steps provided by conventional transmission. Thus transmission automatically selects best "gear ratio" for speed and load.

Description: Built in capacities from 3000 to 8000 lb, trucks are available with gasoline, diesel



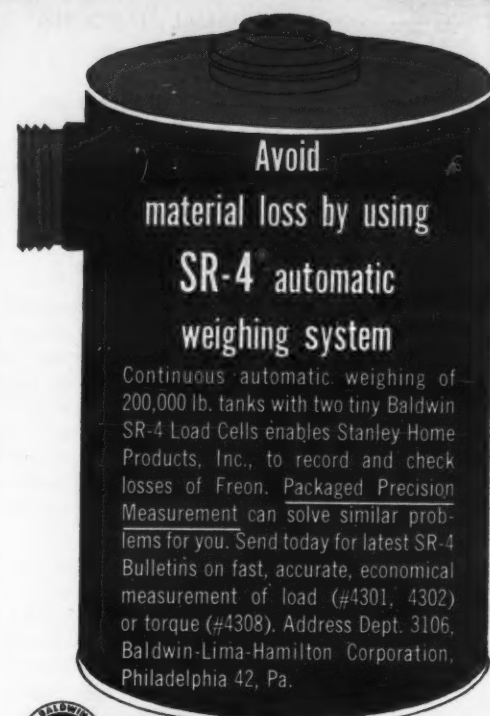
Torque drive permits operation at all speeds without manual shifting of gears

or LPG engines. Transmission overheating is prevented by finned oil lines, running through an auxiliary radiator.

Units are equipped with inching control for smooth and accurate maneuvering. Depression of brake pedal causes slight reduction of clutch pressure—reducing power delivered to drive wheels. Dual brake pedals are provided so that operator may control inching with left foot while right foot depresses accelerator.

(Series KGA 51 industrial trucks are products of Yale Materials Handling Division, Yale and Towne Manufacturing Co., Dept. CP, 11,000 Roosevelt Blvd., Philadelphia 15, Pa. . . or for more information check CP 2610 on Reader Service slip opposite last page.)

5582



Eddystone Division
BALDWIN-LIMA-HAMILTON

When inquiring check CP 2611 opposite last page

moves bulk materials inexpensively ...quietly ...rapidly



G-W
OSCILVEYOR
the VIBRATING CONVEYOR
THAT PUTS ALL VIBRATION TO WORK!

Here's the most inexpensive, practical way to move most loose bulk materials—at speeds up to 50 ft. per min. G-W Oscilveyors as long as 100 ft. powered by one drive unit! Three drive weights—for better distribution, smoother running. All vibration put to work by heavy duty reciprocating springs and new-design rubber-cushioned rocker arms. If a vibrating-type conveyor fits into your picture—don't buy without seeing G-W Oscilveyor first! Write today.

Gifford-Wood Co.
HUDSON, N. Y. AND PRINCIPAL CITIES

When inquiring check CP 2612 opposite last page

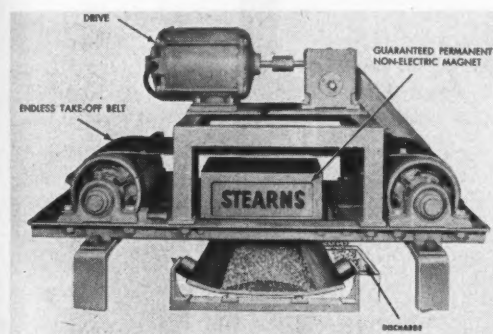
CHEMICAL PROCESSING

**Removes tramp iron continuously,
cleans magnetic component
with endless belt . . .**

power is needed only to operate fractional
hp motor

Uses: Separator removes tramp iron and other
ferrous contamination from flow of material and
makes disposal in continuous operation.

Features: Permanent magnet is guaranteed for
life of installation. No power is needed other than
that required to drive fractional horsepower motor.



Tramp iron is carried away from magnetic components
by endless belt

Description: Unit is suspended above conveyor
belt, chute or sorting table. Alnico V magnets pull
tramp iron out of material flow. Iron is attracted
to magnet face where a cleated endless belt auto-
matically carries it out of magnetic field to dis-
charge station.

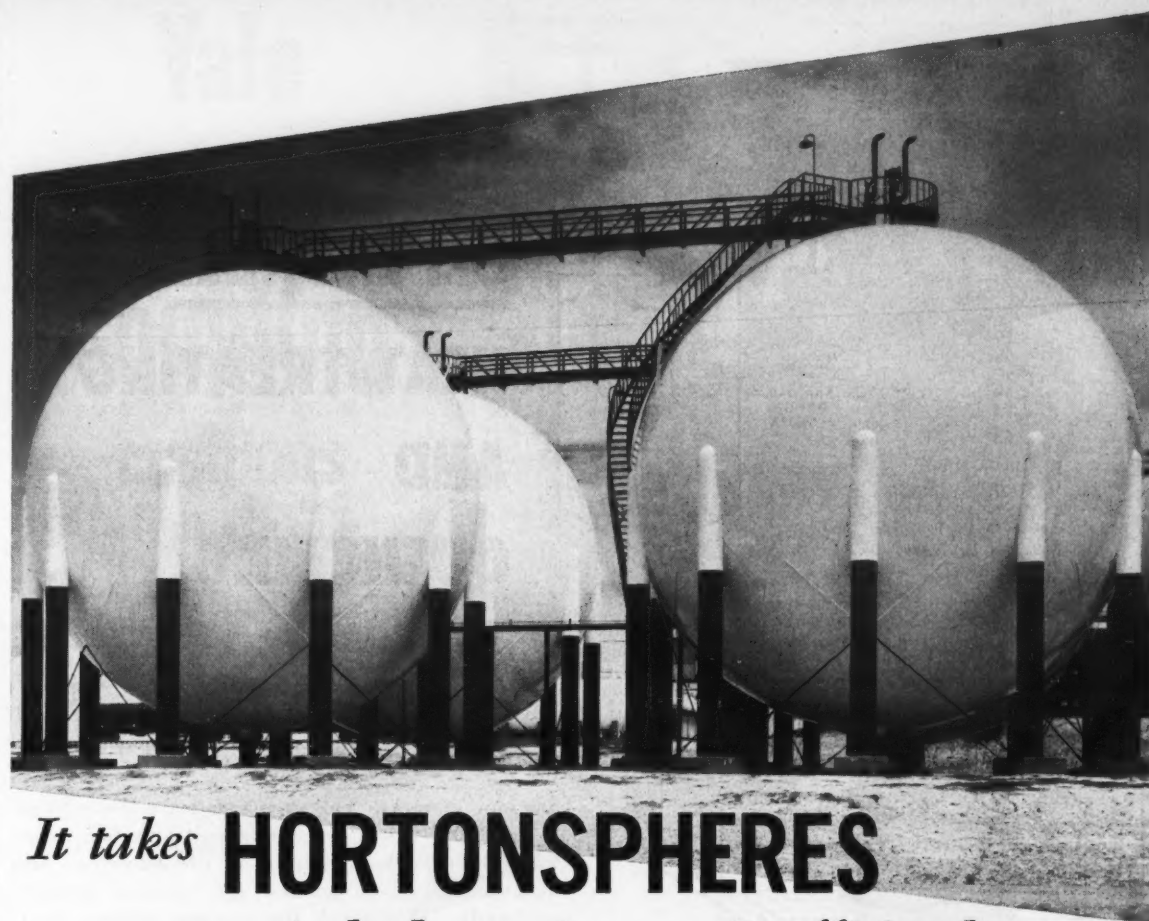
Unit, including motor-reducer drive, is supplied
completely assembled. Separator is available in
various sizes, suitable for suspension up to 4"
above material flow.

(Separator is manufactured by Stearns Magnetic
Inc., Dept. CP, 629 S. 28th St., Milwaukee, Wis.
... or for more information check CP 2613 on
the convenient Reader Service slip which is located
opposite last page.)

**Presents woven wire cloth,
belts, and slings story**

Advantages of woven wire cloth, conveyor
belts, and slings are presented in four-page,
two-color folder. Typical installations and an
outline of specialty products available are also
given.

Bul 111 is issued by Cambridge Wire Cloth
Co., Dept. CP, 940 Washington Blvd., Cam-
bridge, Md. When inquiring reader may simply
specify CP 2614 on form which is located oppo-
site last page.



It takes **HORTONSPHERES** *to store Anhydrous Ammonia efficiently*

Anhydrous ammonia, a highly volatile liquid, must be stored
under pressure to prevent its loss to the atmosphere. The
Hortonsphere® is a *pressure vessel* designed, engineered and built
for the storage of such volatile liquids.

The four 15,000-bbl. Hortonspheres shown above are used to store
anhydrous ammonia at the Lion Oil Company's El Dorado,
Arkansas, chemical plant. The stored ammonia is refrigerated to
about 50° F. to maintain a working pressure in the Hortonsphere
less than 75 lbs. per sq. in.

Hortonspheres are built in sizes to 30,000 bbls. and for
pressures up to 217 lbs. per sq. in. in the smaller sizes. Write our
nearest office for further information.

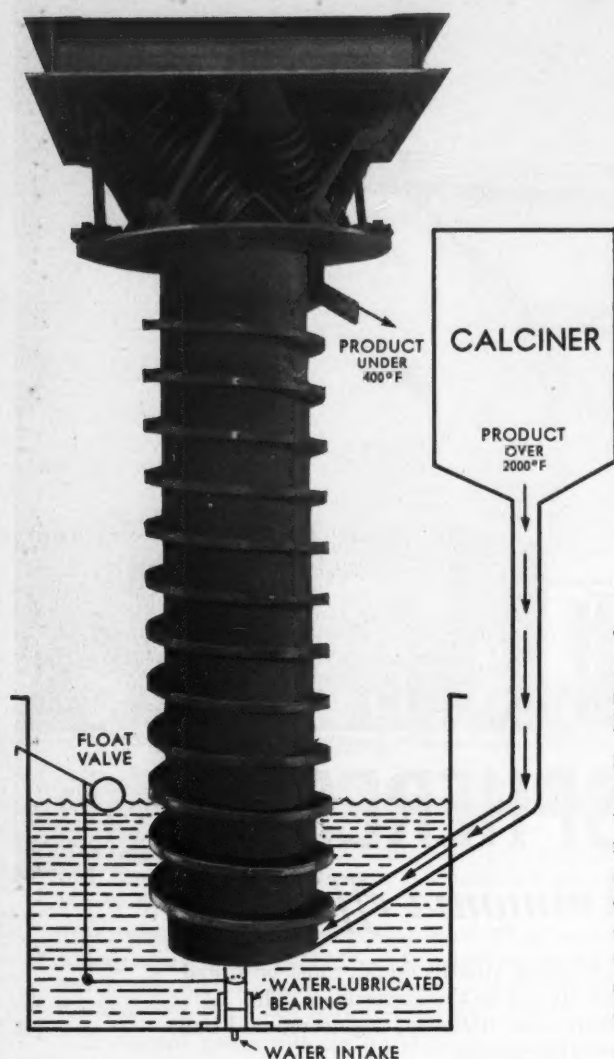


Chicago Bridge & Iron Company

Atlanta • Birmingham • Boston • Chicago • Cleveland • Detroit • Houston
Los Angeles • New York • Philadelphia • Pittsburgh • Salt Lake City
San Francisco • Seattle • Tulsa

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PA.

When inquiring check CP 2615 opposite last page



The Natural-Frequency principle is always used in Carrier Conveyors and other Vibrating Equipment. It accounts for the magic Carrier formula:

LOW HORSEPOWER means LOW OPERATING STRESS
LOW OPERATING STRESS means LOW MAINTENANCE
LOW MAINTENANCE means EFFICIENT, UNINTERRUPTED PRODUCTION

HERE'S DEPENDABLE HEAT-TREATING AND QUENCHING!

This 8-ft. high "spiral ramp" is a Carrier Natural-Frequency Vibrating Conveyor—especially designed for uniform, dependable, continuous quenching on hot chemical catalysts.

See how it works. The chemicals leave the calciner at over 2000°F and are transferred three feet under water onto the bottom spiral of the conveyor. The materials are then agitated and vibrated upward, *uniformly*. They reach the top two minutes later, completely dry, at 400°F. The materials move at a constant speed. The operator can control the discharge temperature *exactly*, by adjusting the float switch to provide either more or less immersion time.

The unit is stainless steel throughout, is powered by a $\frac{3}{4}$ H.P. drive, and has a capacity of 2400 lbs. per hour. It's been "on the job" for over two and a half years—has paid for itself many times over in lowered maintenance costs and increased production!

What are your heat-treating or quenching problems? If they're at all similar—or if they involve bleaching, washing or any other operation where an agitated condition between materials and liquid must be uniformly maintained, Carrier Natural-Frequency equipment will do a better job—and *save you money, to boot!* Write Carrier Conveyor Corporation, 255 N. Jackson St., Louisville 2, Kentucky.

CARRIER NATURAL-FREQUENCY CONVEYORS

When inquiring check CP 2616 opposite last page

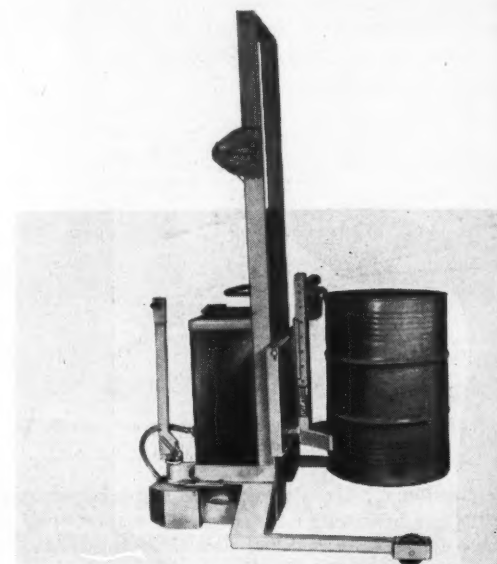
MATERIAL HANDLING

Attaches to hand fork trucks or portable stackers . . .

unit stacks steel or fiber drums without use of pallets

Uses: With hand propelled fork trucks and portable stackers having removable forks or platforms, of either outrigger or counterweighted type.

Features: Will fit any make of hand propelled truck, can be attached or removed by one operator



Unit stacks metal or fiber drums of any size

in one minute. Can handle any fiber or steel drum, open or closed, of any diameter or height. Unit has capacity of 1000 lb.

Description: Attachment mounts on mast of truck, gripping drum at top rim. Unit weighs 37 lb and is 34" high. Extension from carriage is 8".

(Unit is made by Marvel Industries, Inc., Dept. CP, 2224 Cleveland St., Evanston, Ill. . . or for more information check CP 2617 opp. last page.)

Handles bulk materials in quantities of 1 and 1 1/2 cu yd . . .

"pry-out" action is accomplished by use of breakout pads on ground for leverage

Uses: Handling of bulk materials in one cu yd and 1 1/2 cu yd quantities.

Features: Design permits 40 degrees of bucket "breakout" at ground level rather than at "carry" position. "Pry-out" action is accomplished by using

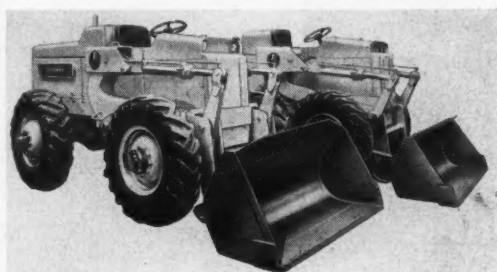
MATERIAL HANDLING



Breakout pads act as fulcrum for leverage

breakout pads on ground as a fulcrum for leverage. Forces are thus transferred to ground through pads rather than to axle, wheels and hydraulic system.

Description: Underslung boom-arms provide more driver visibility and safety. Need for safety guards or screens to protect driver is eliminated.



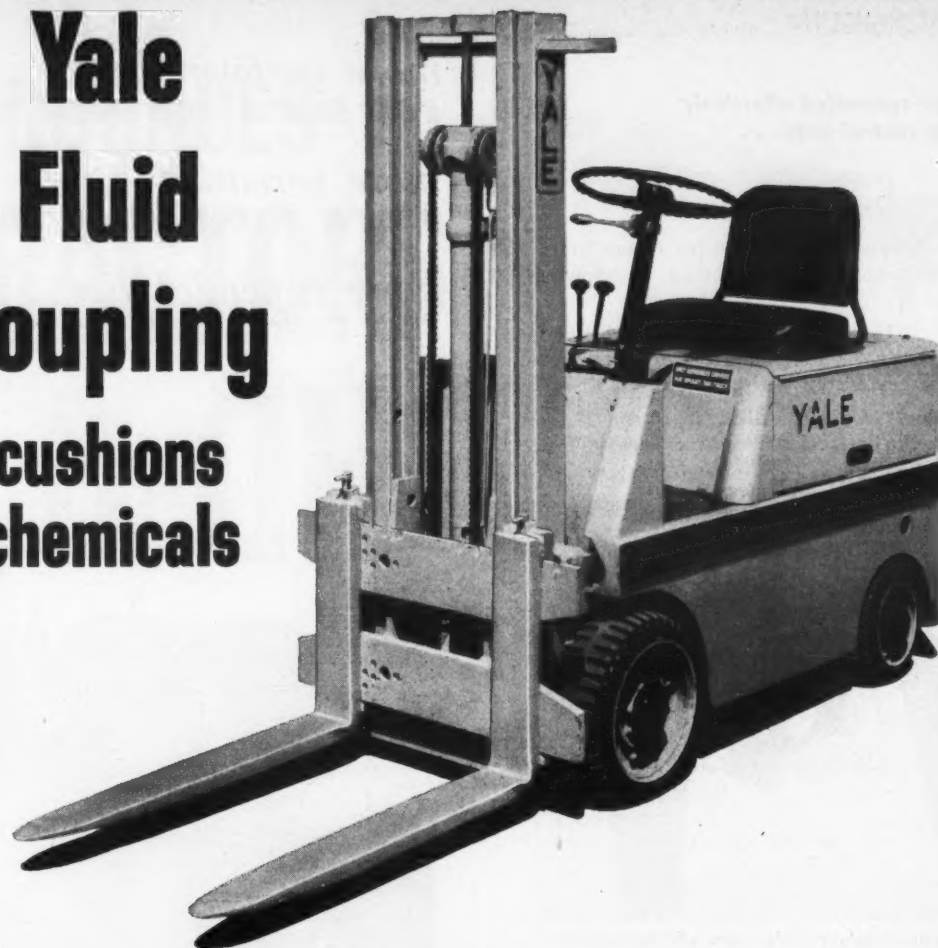
Models HH and HU shovel-tractor have capacities of one and 1½ cu yd

Both models have sealed, pressurized hydraulic system, torque converters and full-reversing transmissions.

(Model HH and HU tractor-shovels are products of the Frank G. Hough Co., Dept. CP, Libertyville, Ill. Check CP 2618 opposite last page.)



Yale Fluid Coupling cushions chemicals



AND ONLY YALE OFFERS FLUID COUPLING IN A SHORT, 2,000-LB. GAS TRUCK!

Now receiving, storing, processing, warehousing and shipping operations can benefit from the jolt-free starts and jar-free stops possible with YALE Fluid Coupling. Available for the first time in a short, light-weight truck, Fluid Coupling cushions loads against rough handling damage... keeps the driver efficiently fresh all through the working day. This new 2,000-lb. truck—the latest addition to YALE's complete line of industrial lift trucks—can't be beat for all-around handling speed, safety and smooth efficiency. And here are some cost-cutting features that no other truck in the 2,000 to 4,000-lb. class can match:

Improved channel assembly gives free lift to 21", high

lift up to 130". Channels mounted on ball-bearing equipped rollers for longer life with less maintenance. **Maximum power**—25 to 31½ hp.—for climbing ramps, carrying and lifting at lower, less wearing range of engine power. **"In line"** gear shift on steering column. Constant mesh transmission reduces gear clash. **Low cowl** for maximum visibility, accurate stacking, safer operation. **One-piece, removable hood** for easy access to entire engine. **Pneumatic or solid tires** for indoor or outdoor use.

To learn how you can put this new truck to work in your chemical processing operations, call a YALE representative today or mail coupon now.

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

* Reg. U.S. Pat. Off.

**Gas, Electric, Diesel & L-P Gas Industrial Trucks • Worksavers
Warehouses • Hand Trucks • Hand & Electric Hoists**

MAIL THIS COUPON TODAY

The **YALE & TOWNE** Mfg. Co., Dept. 1212
Roosevelt Blvd., Philadelphia 15, Pa.

I would like to have additional facts about

☐ Gas Trucks ☐ Electric Trucks ☐ Attachments
☐ Worksavers ☐ Hand Trucks

Company _____

Name _____ Title _____

Street _____ City _____ State _____

In Canada write: The Yale & Towne Manufacturing Co.
St. Catharines, Ontario, Canada

When inquiring check CP 2619 opposite last page

MATERIAL HANDLING

Discharge controlled effectively by swing control gate . . .

bin, of 12-gage steel, is available in 10 or 25-ton capacities

Uses: All-steel storage unit for cement, minerals, rock phosphate and similar free-flowing materials.

Features: Unit has hopper bottom with swing control gate (not a sliding valve) for more effective discharge control.

Description: Unit is available in 10 and 25 ton capacities. Bin is fabricated in one unit on four



Swing control gate provides more effective control of discharge

legs, eliminating any assembly on delivery. Unit, of 12-gage steel, has 18" manhole located on top. Ladder, for access into bin, is mounted on inside. (Bulk storage bin is product of Andrews Machine Co., Dept. CP, 359 E. Main, Decatur, Ill. . . . or check CP 2620 opposite last page.)

Conveyor is cleaned with hot water or steam . . .

reversible-direction unit operates at speeds up to 100 feet per minute

Uses: In operations, such as food or chemical handling, that call for non-corrosive and easily cleaned conveyors.

Features: All surfaces may be cleaned or decontaminated with hot water or steam.

Description: Belt operates at variable speeds up to 100 feet per minute in either direction. Reversal is by means of a control switch. Each foot of belt is supported by 8 or more rollers. Belts are available

more performance . . .
FOR SUSTAINED HIGH OUTPUT!

more versatility . . .
FOR A WIDER RANGE OF WORK!

more dependability . . .
FOR LOWER JOB COSTS!

TWO NEW

HD-6

BULLDOZER-DRAWBAR TRACTOR

Weight	12,400
Drawbar hp	45
Belt hp	55



STEP UP PERFORMANCE, CUT MATERIAL HANDLING COSTS WITH EXCLUSIVE HD-6 FEATURES LIKE THESE...

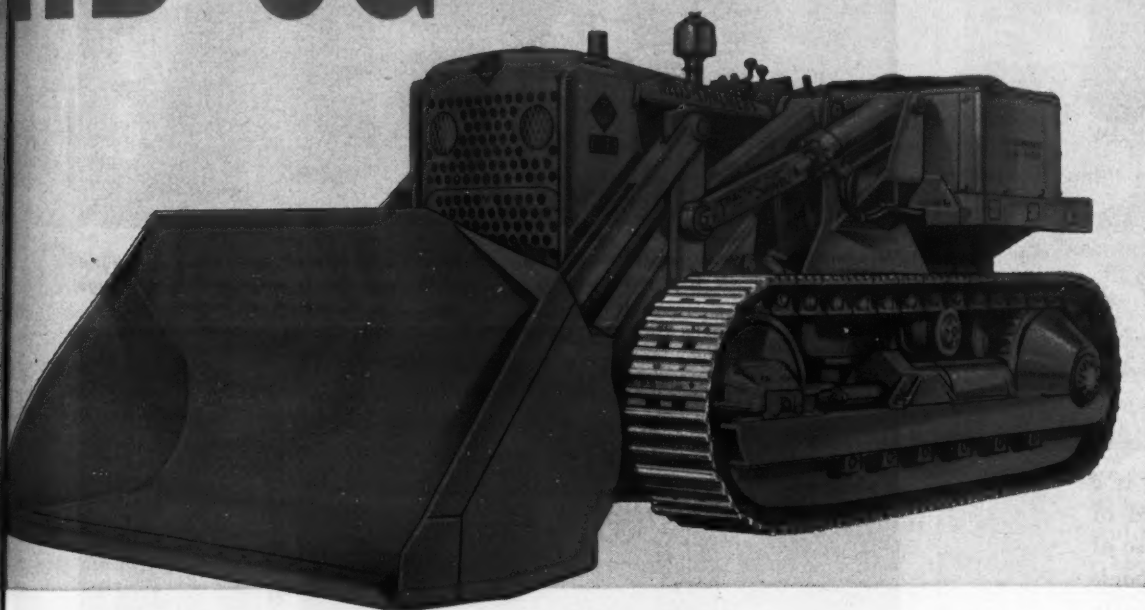
- ★ Allis-Chalmers heavy-duty diesel engine — with "follow-through" combustion for long life, low upkeep.
- ★ 24-volt direct electric starting — for convenience and efficiency (standard equipment).
- ★ Wrap-around radiator guard for maximum strength and protection . . . tilts forward for easy service.
- ★ Ceramic master clutch lining — lengthens clutch life, reduces lever pull.
- ★ All-steel box-A main frame — protects the entire power train, makes possible superior balance . . . plus the service simplicity of unit construction.
- ★ One-piece steering clutch and final drive housing — for maximum strength, accurate bearing and gear alignment.
- ★ Double reduction final drives (straddle-mounted on tapered roller bearings) provide maximum ground clearance.
- ★ Roller bearing truck wheels — with Positive Seals that keep dust and moisture out . . . grease in.
- ★ 1,000-Hour lubrication intervals for truck wheels, idlers and support rollers.
- ★ Tru-Dimension tracks — with new standards of strength and hardness *throughout* for extra wearability.
- ★ Unit construction — major assemblies like engine, clutches and final drives can be removed without disturbing adjacent parts.
- ★ Engine-mounted bulldozers — for top performance and extra tractor life.

ALLIS-CHALMERS ANNOUNCES NEW HD-6 SERIES TRACTORS

HD-6G

TRACTOR SHOVEL

Weight	19,600
Drawbar hp	45
Net engine hp	57
Bucket capacity	1-1/3 cu yd



...PLUS TRACTOR SHOVEL FEATURES LIKE THESE...

- ★ Extra long track (almost 7 ft on the ground) with six truck wheels per side — for real stability throughout the digging and loading cycle.
- ★ New two-position bucket — for easy full-capacity loading in any material (standard equipment).
- ★ Heavy-duty shovel assembly — built right into

the tractor, not just an attachment.

- ★ Simple, safe hydraulic system — with no exposed hoses or fittings on cowl or deck.
- ★ Two-speed reverse, high foam-rubber seat and easy bucket control — for new tractor-operator efficiency.

Big 2¼-cu yd bucket speeds handling of coal, snow, other light materials

GET ALL THE FACTS NOW FROM YOUR NEARBY ALLIS-CHALMERS DEALER

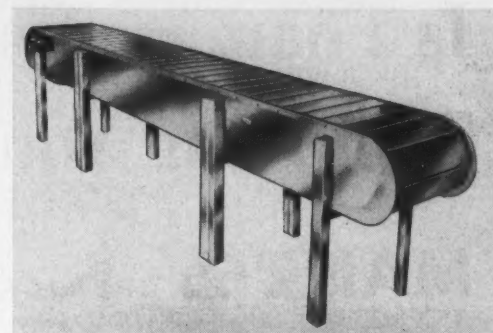
CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



When inquiring check CP 2621 opposite last page

MATERIAL HANDLING



Aluminum surfaces are easily cleaned with hot water or steam

in widths from 6 to 96" and in lengths up to 175 feet. Units are fabricated in five-foot sections.

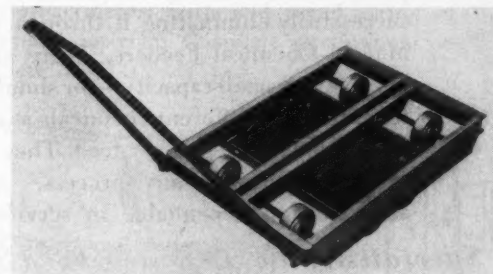
(Pre-Fab conveyor is manufactured by Mercury Industries, Inc., Dept. CP, Hillsdale, N. J. . . . or for more information check CP 2622 on form opposite last page.)

Provides one-man handling of loads up to two tons . . .

steel framed dolly rolls on 24 wheels, is tip-steered

Uses: Moving palletized material, skids and similar loads.

Features: Rubber tired models for rough or slatted floors have capacity up to 2500 lb. Aluminum wheel models carry up to two tons on smooth



24-wheel dolly lets one man move two tons

surfaces. Dolly is available in 12 sizes, ranging from 42 x 30" to 60 x 60". Removable handle may be used for towing or as push bar handle.

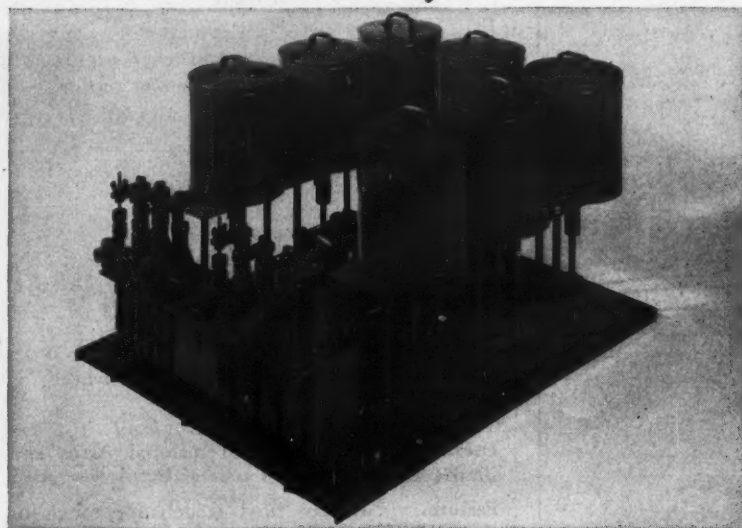
Description: Rolls on 24 wheels, interlaced and tandem mounted. All wheels are ball-bearing equipped, sparkproof.

(Dolly is made by Roll-Rite Corp., Dept. CP, 801 Jefferson St., Oakland 7, Calif. . . . or for more information check CP 2623 on form opposite last page.)

Is Foam Troubling You?

MANZEL CHEMICAL FEEDERS

CAN STOP IT!



* In chemical processes where foaming is a problem, Manzel engineers have a record of successfully eliminating it through the use of Manzel Chemical Feeders. There are models of large and small capacity—for simultaneously feeding many different chemicals at rates from a few drops to 60 gph per feed. They are easily synchronized with any process—supremely accurate and dependable in service.

Specialists, too, in Force Feed Lubrication

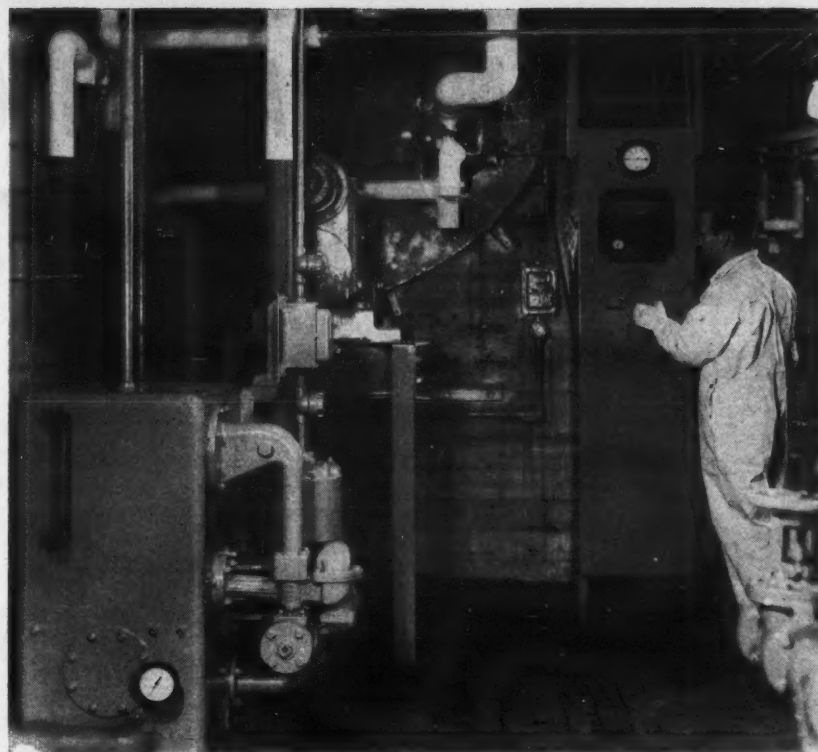
Manzel Force Feed Lubricators can be depended upon to deliver exactly the right amount of lubricant, to exactly the right places, at exactly the right times. Available for operation against discharge pressures of up to 30,000 P. S. I. G.



Professionally qualified engineering
representatives throughout the country.

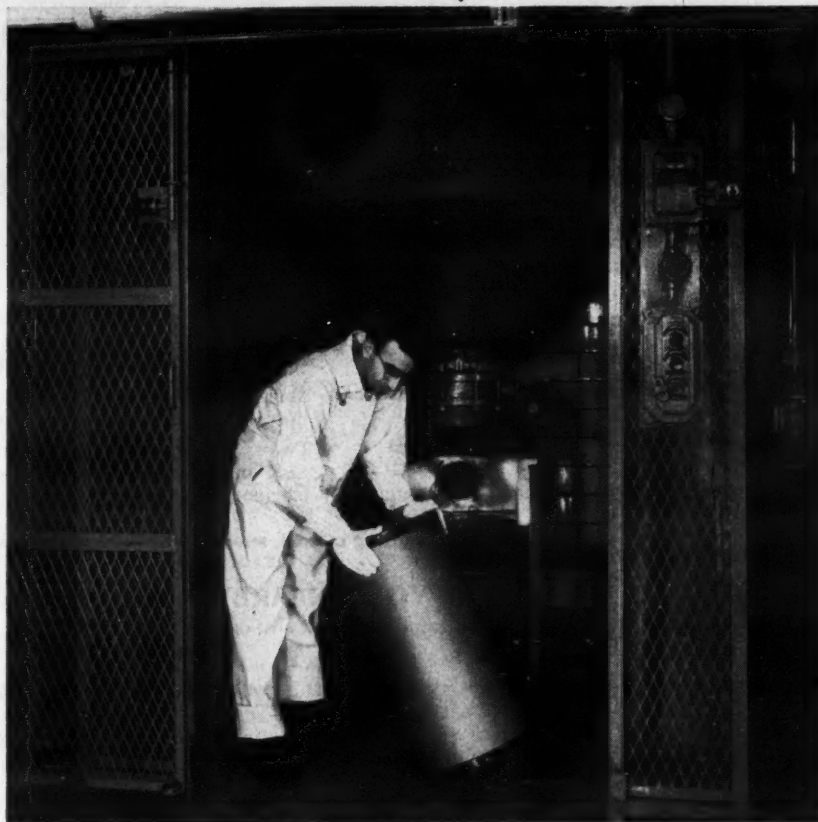
DIVISION OF
HOUDAILLE-HERSHEY CORP.
274 BABCOCK ST., BUFFALO 10, N. Y.

When inquiring check CP 2624 opposite last page



Vacuum pump system (at left) provides 22-28" vacuum for dryer jacket

Dryer (in background) has working capacity of 15-16 cu ft. Unit is easily discharged through 8" opening on bottom



processing equipment

Here's story of how glassed steel conical dryer solved drying problem at Eastman Kodak. Easy-to-clean unit reduces labor, assures high purity product, and . . .

slashes drying time 75%

Organic halide now dried in 20-22 hours
— used to take 4-6 days

By **TED F. MEINHOLD**, Assistant Editor
with **RALPH J. BERNER**,
Chemical Engineer
Eastman Kodak Company

Problem: A faster and easier way of drying a corrosive organic halide was sought by Eastman Kodak Company engineers. Old method, using an atmospheric tray dryer, took from 4-6 days and was a tedious operation. Prior to drying, the halide is centrifuged from glacial acetic acid saturated with corrosive HBr. Dry bulk density of material is about 25 lb per cu ft. The high-purity produce is used in the manufacture of materials for color photography.

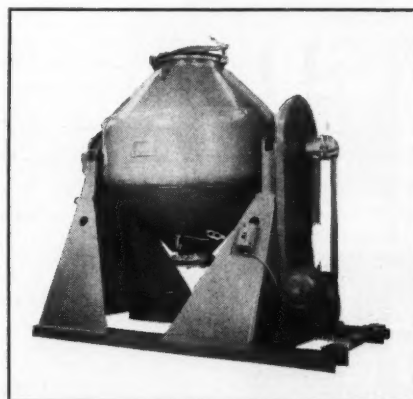
Solution: Company installed a glassed steel conical dryer-blender for the operation. Consisting of a glassed steel, jacketed, conical tank, rotated by a synchro-gear motor with variable-speed drive, dryer is operated under 22-28" vacuum and 175-185°F. Tumbling action speeds drying because it keeps exposing new surface areas from which evaporation can take place. Jacket is of carbon steel and accommodates pressures up to 40 psi. Steam under pressure or vacuum is used for heating.

Dryer vacuum is provided by a two stage Haveg ejector system. The vapor line inside unit is covered with woven glass cloth (National Filter Media, Style G 201) to prevent dust entering the ejector system. Capacity of dryer is about 29 cu ft with a working capacity of 16-16 cu ft. Unit is filled through a 16" diameter opening and discharged through 8" nozzle.

zle. Heating steam enters jacket through center of one trunnion and condensate leaves through pipes from top and bottom of jacket and annular space of trunnion.

Results: Material is now dried in 20-22 hours, instead of 4-6 days previously required — cutting time by at least 75%. Cleaning the unit between batches is a simple operation. Glassed steel lining resists corrosion, reduces product adherence, assures high-purity product, and reduces clean-up losses and labor. Filter cloth on vapor pipe is changed about once a week. A second unit has also been installed for drying various other products.

(Conical glassed steel dryer-blenders are product of The Pfaudler Company, Dept. CP, 1000 West Avenue, Rochester 4, New York . . . or for more information check CP 2625 on form opposite last page.)



Glassed steel conical dryer, similar to this one, is used for drying corrosive organic halide at Eastman Kodak Company



Hardinge 9' x 22' Pebble Tube Mill in an Ohio plant producing silica flour.

Hardinge TUBE MILLS...

... for wet grinding

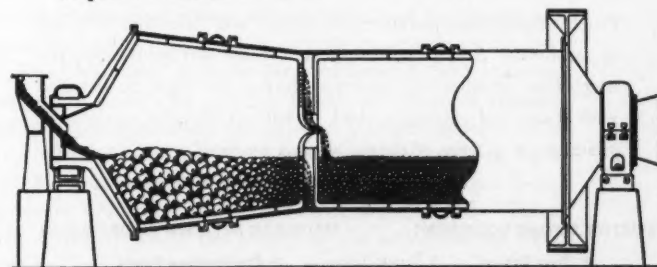
(in water or acid pulps)

Titanium Pigments
Manganese Dioxide
Diatomaceous Earth
Limestone

... for dry grinding

Fillers
Silica Flour
Gypsum
Carbon Black
Pigments
Cement materials

Regardless of the requirements, Hardinge Tube Mills are designed to meet specific needs. Available from 2 to 10 feet in diameter; 6 to 35 feet in length; single or multiple compartments; with acid proof lining of rubber, silica and porcelain. Complete specifications on request. Bulletin 18-B-13



Tricone compartment Tube Mill with grate and lifters.

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COMPANY, INCORPORATED

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When inquiring check CP 2626 opposite last page

More Profits through Proctor Drying Ranges

- Newest Pre-forming Techniques
- Improved Air Distribution
- Faster, More Uniform Drying
- Flexibility of Operation
- Guaranteed Product Quality



PROCTOR CONTINUOUS CONVEYOR DRYER AT NATIONAL YEAST COMPANY

Yeast requires sensitive drying methods. This Proctor & Schwartz installation at National Yeast Company maintains the uniform quality, color, and viability of the yeast at considerably increased drying rates.

Proctor equipment provides the control and flexibility essential to profitable drying performance. Many wet-solid materials heretofore unsuited to conveyor drying can now be handled with speed and efficiency. And, as with all Proctor equipment, guarantee is in terms of finished product produced.

WRITE FOR BULLETIN #390

PROCTOR DRYING EQUIPMENT

- Tray Dryers
- Truck Dryers
- Pre-forming Feeds
- Continuous Conveyor Systems
- Spray Dryers



PROCTOR & SCHWARTZ, Inc.

Manufacturers of Industrial Drying Equipment and Textile Machinery
Philadelphia 20, Pa.

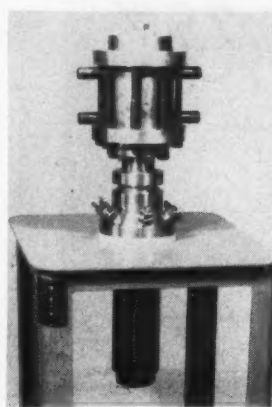
When inquiring check CP 2627 opposite last page

PROCESSING EQUIPMENT

**"Canned" motor agitator drives
on reactors don't leak
at 10,000 psi . . .**

stuffing boxes and rotary seals eliminated, shaft speeds up to 3450 rpm possible

Uses: Conducting high-pressure reactions in pilot plants and laboratories.



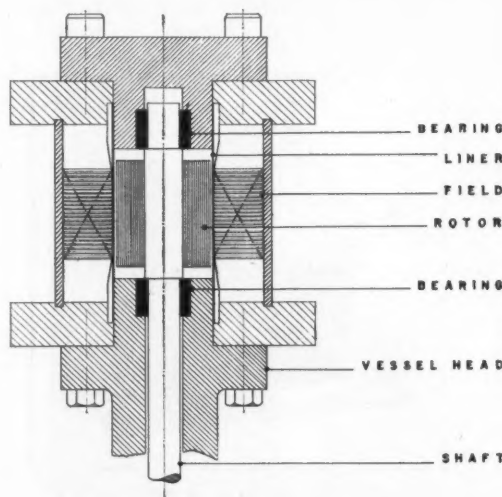
"Canned" motor agitator drive on reactor operates by induction

Features: Reactors have "canned" motor agitator drives. Elimination of stuffing boxes and other rotary seals prevent leakage and contamination of products being processed. Shaft speeds of 600 to 3450 rpm are possible. Pressure range is up to 4000 psi. Drives for pressures to 10,000 psi are possible on special application.

Description: Reactors are available in capacities from

250 ml to 25 gal. Heating can be achieved by jacket (steam, Dowtherm, oil), internal coil, or external electrical strip heaters. Closure designs include flanged, set screw, full Bridgman, O-ring, others.

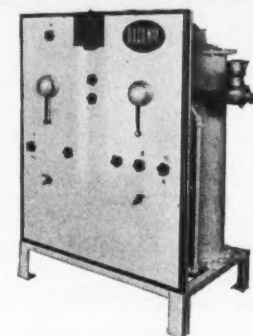
The "canned" motor doesn't need a stuffing box. Torque of the moving part, or rotor, is created by means of induction through a corrosion-resistant, non-magnetic liner which separates the process fluids from the outside motor windings, or stator. Seals are



Details of agitator drive and attachment to vessel



"PACKAGE-UNIT" DE-IONIZER



Here, in one assembly, with gray lacquered panel, main and auxiliary valves, and all accessories — is a complete De-Ionizing installation that can be set down as a unit anywhere in your plant. Two-Bed and Mixed-Bed models are available for various specifications of effluent, in standard designs, with capacities ranging from 150 to 1,000 gallons per hour.

COMPLETELY ASSEMBLED AND TESTED AT FACTORY

Standardized ILLCO-WAY "Package-Unit" De-Ionizers are completely put together at the factory, including assembly of all piping and valves, attachment of accessories, and placing of ionXchange minerals in the tanks. Each is thoroughly tested, then crated and shipped as a fully-assembled, ready-to-operate unit requiring a minimum of installation time. For complete details of these efficient, compact, and time-proved Units, write for a copy of our Bulletin PK-154.

ILLINOIS WATER TREATMENT CO.



840 CEDAR ST.
ROCKFORD,
ILLINOIS

NEW YORK OFFICE: 141 E. 44TH ST., NEW YORK 17, N. Y.
CANADIAN DIST. PUMPS & SOFTENERS, LTD. LONDON, ONT.

When inquiring check CP 2628
opposite last page.

CHEMICAL PROCESSING

provided at each end of this liner and inert carbon bearings carry the shaft supporting the rotor. Rotor is completely shrouded with the material selected for the installation (316 stainless steel, titanium, Inconel, or Hastelloy).

There are no brushes, contacts, commutators. Induction between stator and rotor provides necessary torque for agitation. Motors are available with hp ratings from 1/12 to 10. Propeller, turbine, vaned gas disperser, paddle, and other types of agitators are available.

(Vessels with canned motor agitator drives were developed in conjunction with Chempump Corporation and are products of Pressure Products Industries, Dept. CP, 412 South Warminster Road, Hatboro, Pennsylvania . . . or for more information reader may simply check CP 2629 on Readers Service slip which is located opposite last page.)

Boost paper mill capacity with side roll splicing machine . . .

minimizes waste and need for repulping, can join up to five rolls of paper

Uses: Splicing side rolls of paper.

Features: Machine will join together as many as five narrow rolls of paper to produce a single finished roll up to 85" wide. Necessity of repulping side rolls is thereby minimized and saleable mill capacity increased.

Description: Unit consists of two or more stands from which rolls are unwound, rotary grinders which bevel edges to be joined, dust collection system, glue applicators, series of threading rolls, compression rolls, and rewinder for finished roll. Water-cooled brakes are provided to control unwinding and web tension.

In operation, two or more rolls are unwound at speeds of 500 fpm or greater. As surfaces to be joined are ground, slightly more than one-half original thickness is ground off. Grinding dust is collected and may be returned to beaters. Glue is applied to only one of the two surfaces which are then joined and pressed together as they pass through compression rolls and on to rewinder. Resulting seam is about $\frac{3}{8}$ " thick and is same thickness as remainder of stock, with no hump or hollow evident on finished roll.

Machine is approximately 24' long, 14' wide, and 7' high. It handles webs as narrow as 5", and can weld newsprint, strawboard, kraft, liner board, and corrugating medium.

(Webwelder is product of Dorr-Oliver Incorporated, Dept. CP, Barry Place, Stamford, Conn. . . . or for more information check CP 2630 on form opposite last page.)

Lapp introduces the "MICROFLO" PULSAFEEDER

A CONTROLLED-VOLUME PUMP FOR PRECISION PUMPING AT MICRO-FLOW RATES



Now, a controlled-volume proportioning pump for laboratory application, pilot plants, and industrial production, where requirements are for pumping of precise volumes at micro-flow rates without risk of leakage or contamination of fluid being pumped. The "Microflo" Pulsafeeder combines the best features of both piston and diaphragm pumps by using a piston for constant volume measuring purposes and a diaphragm to seal the product pumped against leakage or contamination. All liquid handling parts have been selected for their resistance to corrosion. Maximum pumping capacity is 2150 ML. per hour, maximum discharge pressure 1000 psig. Pumping rate of the "Microflo" Pulsafeeder can be manually adjusted while the pump is idle or operating, or if desired, complete operation can be governed by automatic controls.

Lapp

WRITE

for Bulletin 500 which contains complete information and specifications on the new "Microflo" Pulsafeeder. Lapp Insulator Co., Inc., Process Equipment Division, 483 Wilson St., LeRoy, N. Y.

When inquiring check CP 2631 opposite last page

IMPROVED CONDENSING and Cooling of Reflux



Niagara Aero Heat Exchangers at a Plant of the Heyden Chemical Corp.

Get Better Control of Distillation Product

● Liquid or vapor temperatures are always held constant by the Niagara "Balanced Wet Bulb" control method of evaporatively cooling or condensing, which automatically varies the cooling effect proportionately to the load. The distillation product is therefore uniform throughout all changes in climatic conditions the year around; it is the same in the heat of summer as in the freezing cold of winter. Continuous maximum production is thus insured.

Non-condensibles are effectively separated at the condensate outlet, with notable sub-cooling after separation for greater vacuum pump efficiency.

NIAGARA AERO HEAT EXCHANGERS give sustained full capacity in cooling and condensing with no dependence on cooling water . . . eliminating problems of water supply, availability, temperature, or quality.

For full information write for Bulletin 120

NIAGARA BLOWER COMPANY

Over 35 Years of Service in Industrial Air Engineering

Dept. C.P., 405 Lexington Ave.

New York 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

When inquiring check CP 2632 opposite last page

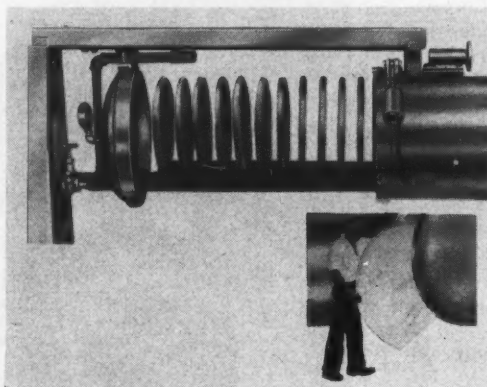
PROCESSING EQUIPMENT

**Hydraulic door, "lift-out" leaves,
speed filtering operations
on horizontal unit . . .**

each leaf can be removed, snapped-back in place without unfastening a bolt

Uses: Various filtering operations in chemical, food, and other industries.

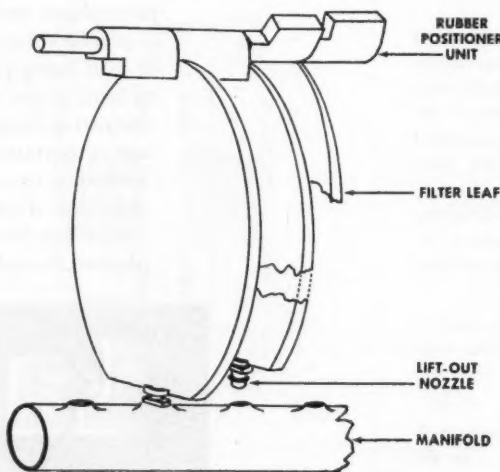
Features: Quick-opening, hydraulically-operated door and "lift-out" leaves speed filtering and clean-



Entire filter assembly can be withdrawn from shell. When opened, leaves are easily removed for cleaning or inspection

ing operations and simplify recovery or disposal of filter cake.

Description: Door is opened quickly with hydraulic device. There are no bolts or nuts. When opened, leaf assembly can be easily withdrawn from shell. Smaller units have hand cranks for removing assembly. Larger models can be equipped with pneumatic cylinder or gear drive.



Leaves are held in place by rubber positioner and O-ring device

now...

**more effective
and economical**

ENTRAINMENT SEPARATION

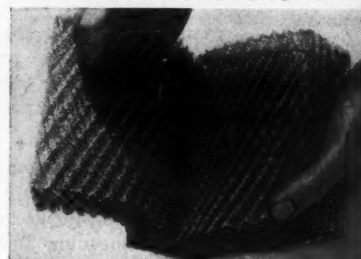
with the

NEW HI-THRUPUT HERRINGBONED MIST ELIMINATOR

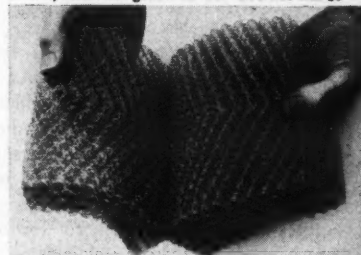
Check these important points:

1. Half the pressure drop of Standard Mist Eliminator.
2. Safe operating limits — 10% to 12% higher velocity.
3. Entrainment removal practically 100% over wider operating range.
4. Three to four times longer on-stream life under coking conditions or where solids are present.
5. Lower cost — wires repositioned by Herringbone Fold®.

*U.S. Patent No. 2,565,846, Aug. 28, 1951



These photos show the difference. Full explanation given in our Booklet ME-5.



Send for Revealing Booklet ME-5. Learn how repositioning wires by patented Herringbone process and change in size and contour of mesh openings make this new Mist Eliminator more effective and economical.

METAL TEXTILE CORPORATION

Roselle, New Jersey
Metal Textile Corporation
of Canada, Ltd., Hamilton, Ont.



When inquiring check CP 2633
opposite last page

CHEMICAL PROCESSING

Each leaf may be lifted out without unfastening a bolt. Leaf snaps back into place on manifold and is held securely by rubber positioner and leak-proof O-ring device. Leaves can be semi-round or square. Cake is removed by shaking or scraping. Optional vibrating attachment is also available. Filters are available in wide range of materials. Capacities range from 10 to 2000 sq ft of filtering area.

(Type N. H. horizontal pressure filters are products of Industrial Filter & Pump Mfg. Co., Dept. CP, 5900 Ogden Avenue, Chicago 50, Illinois . . . or check CP 2634 opposite last page.)

**Continuous contact column
adaptable to a variety
of operations . . .**

can be used to convert many batch operations into continuous-flow processes

Uses: Solvent extraction, absorption, adsorption, ore leaching, dissolving, decolorization, and for converting many batch operations into continuous-flow processes.



Continuous contact column exposes liquids to solids more efficiently. Solids are fed into unit through angular pipe at right. Liquid enters column at bottom, flows upward counter-current to settling solids

Features: Column is built of steel, but can be constructed of special metals to resist corrosion, or lined with rubber or other suitable materials as required.

Description: Flow of solids is regulated by a series system of flow plates with rotating scraper arms. Arms move across plates to plate openings so that solids gravitate to plate below. Plate openings are arranged in staggered rotation so that each plate supports portion of the total solids charge in the unit.

Upward flow of liquid is varied depending upon ratio of sp gr of solids to liquids, and settling time. Contact time is established by depth of solids on each plate, size of openings in the plates, speed of scraper rotation, and rate solids are discharged from bottom of unit.

(Continued on next page)

STURTEVANT MICRONIZER* GRINDING MACHINE

Grinds Materials To Any Micron Size Specification

**NOW AVAILABLE FOR
OUTRIGHT SALE**

The Sturtevant *Micronizers* are fluid jet grinding machines designed to reduce solid materials to particle sizes in the micron range.

Using compressible fluids, air or steam, as the source of energy, *Micronizers* produce pulverized materials to specifications unobtainable by other mechanical equipment such as ball, pebble or hammer mills.

The variety of materials processed is large and includes both nonmetallic and metallic minerals and ores, metals, pigments, insecticides, fungicides, pharmaceuticals, plastics, dyes and numerous other organic and inorganic products.

It is quickly and easily cleaned on changes of formulation with minimum loss of material. Simple to install and operate. It is available as a machine alone . . . or as a complete grouping with pre-mixing, grinding and bagging equipment. Write for complete information, today.

*Micronizer is the Registered Trademark of the Sturtevant Mill Company.

STURTEVANT MILL COMPANY

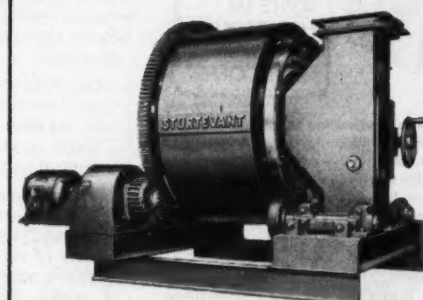
119 CLAYTON STREET, BOSTON 22, MASS.

Designers and Manufacturers of CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS
MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

When inquiring check CP 2635 opposite last page



24" Size
Capacities 1000
to 1200 lbs.
per hour



Sturtevant Dry-Batch Mixer for mixing materials into a homogeneous mass. 5 models: 1/4 to 2 tons.

what is your
PULVERIZING
problem?

accept this offer by
Schutz-O'Neill for a

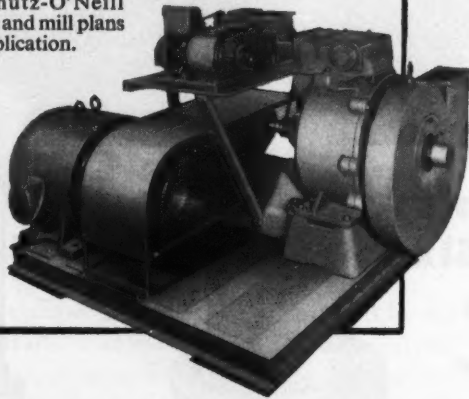
FREE TEST GRIND OF YOUR MATERIAL SAMPLE

Without obligation to you, we'll grind a sample of your material in our Pilot plant, using a production model Schutz-O'Neill Superfine Pulverizer. This is a bonafide, no-strings offer to demonstrate to you the versatility, particle size range and capacity of Schutz-O'Neill Pulverizers. Write us for details.

OUR ENGINEERING TEST REPORT together with your processed product will be returned to you giving exact data and recommended Schutz-O'Neill equipment, methods and mill plans for your process application.

SCHUTZ-O'NEILL PILOT PLANT

uses a standard production model 16" Superfine Pulverizer, which provides up to 100 different pulverizing set-ups with a grinding range from 40 mesh to 5 microns.



ULTRAFINE GRINDING WITH CONTROLLED PARTICLE SIZE RANGE

You'll find Schutz-O'Neill Superfine Pulverizers best for ultrafine grinding with controlled particle size distribution—yet their versatility also makes them adaptable to the complete grinding range from coarse to ultrafine.

Many heat sensitive products can be safely pulverized, because the grinding principle of impact with air attrition embodied in Schutz-O'Neill design keeps product temperatures down and helps control uniformity.

Typical Schutz-O'Neill applications are in the paint industry; major cocoa powder, sugar, spice and pharmaceutical manufacturers; processors of emulsifier gums, resin, plastic and seaweed extract powders and a great number of others. From 62 years of continuous manufacturing and field experience, Schutz-O'Neill may already have the answer to your problem. Superfine Pulverizers are made in six sizes ranging from 7½ to 125 horsepower with grinding chambers 12" to 28" in diameter.

See us at Booth 418,
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Dec. 5-9



SCHUTZ-O'NEILL COMPANY

343 Portland Avenue • Minneapolis 15, Minnesota

PULVERIZERS
GRANULATORS
ROLLER MILLS
AIR CLASSIFIERS
SIFTERS
HAMMERMILLS

When inquiring check CP 2636 opposite last page

PROCESSING EQUIPMENT

(Continued from preceding page)

Quantities processed per unit depend upon characteristics of individual material as well as size of column. Units are available from 12 to 84" in diameter, with processing capacities up to 1000 tons per day (in terms of solids flow). Number of plates, spacing between plates, and column height may be varied as required. Normally, a minimum of 20 plates, spaced not more than 12" apart, gives satisfactory results.

Retention time can be varied by proper combination of open plate area, scraper rotation speed, and rate of solids discharge. Normally, plate openings are maintained at 12 to 20 per cent of total plate area. Openings may be different in shape or number, depending upon application. Retention time of 30-45 minutes is usually adequate. Solids are discharged from bottom of unit by means of a liquid-tight conveyor. Rental unit (12") is available for tests.

(Continuous contact column is product of General Machinery Division, Allis-Chalmers Manufacturing Company, Dept. CP, 1151 S. 70th Street, Milwaukee 1, Wis. . . or for more information check CP 2637 on form opposite last page.)

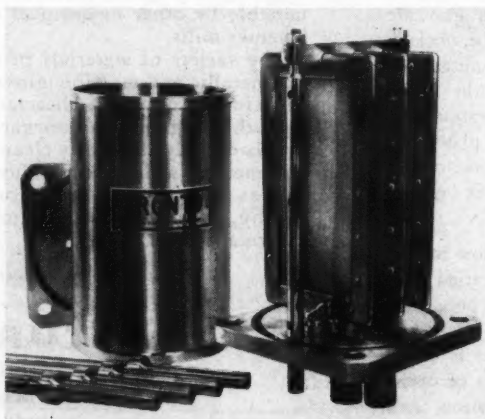
Portable filter specially designed for research, development . . .

unit is 16" high, has 6½" shell diameter

Uses: Designed for filtration research, and for the determination of filtration characteristics needed for production-filter selection.

Features: Compact filter measures 16" high and has 6½" shell diameter. Unit can be set up in plant or laboratory. Design permits use of one, two, or three vertical filter leaves.

Description: Pilot filter can be used to obtain specific filtering rates of liquids in gpm per sq ft.



Pilot filter's design permits use of one, two, or three vertical filter leaves

SPRAY NOZZLES

for chemical
spraying,
cooling,
humidifying,
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and hundreds
of other
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You'll get the
right nozzles
quicker by
calling Binks...
manufacturers
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A wide range of spray patterns, sizes, capacities...with nozzles cast or machined from standard or special corrosion-resistant metals.

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Binks
MANUFACTURING CO.

A COMPLETE LINE OF
INDUSTRIAL SPRAY NOZZLES
AND COOLING TOWERS

When inquiring check CP 2638
opposite last page

CHEMICAL PROCESSING

Cake density and washing efficiency can also be determined. Unit can be used for precoat filtration (using diatomaceous earth and similar materials) or for evaluation of filter fabrics.

With three identical leaves, spaced at $1\frac{1}{2}$ " centers, a net filtering area of 1 sq ft is provided. Leaves are covered with 24x110 Dutch weave metal cloth, bound in U-shaped frames. Leaf outlet nozzles are sealed by O-rings. Filter is constructed of stainless steel and has maximum working pressure of 80 psi. Major pipe connections are located in base plate so that unit can be disassembled simply by removing nuts from four tie-rods.

(Pronto-junior filter is product of American Plant Equipment Company, Dept. CP, 220 Fifth Avenue, New York 1, New York . . . or for more information check CP 2639 on form opposite last page.)

Outlines cost savings provided by rotary tube dryers

Cost savings provided by rotary steam tube dryers for soda ash and allied industries are outlined in eight-page bulletin. Complete with photographs, literature outlines in detail the mechanical features of the units.

Bul SW558-GW is issued by Struthers Wells Corporation, Dept. CP, Warren, Pa. When inquiring specify CP 2640 on form which is located opposite last page.



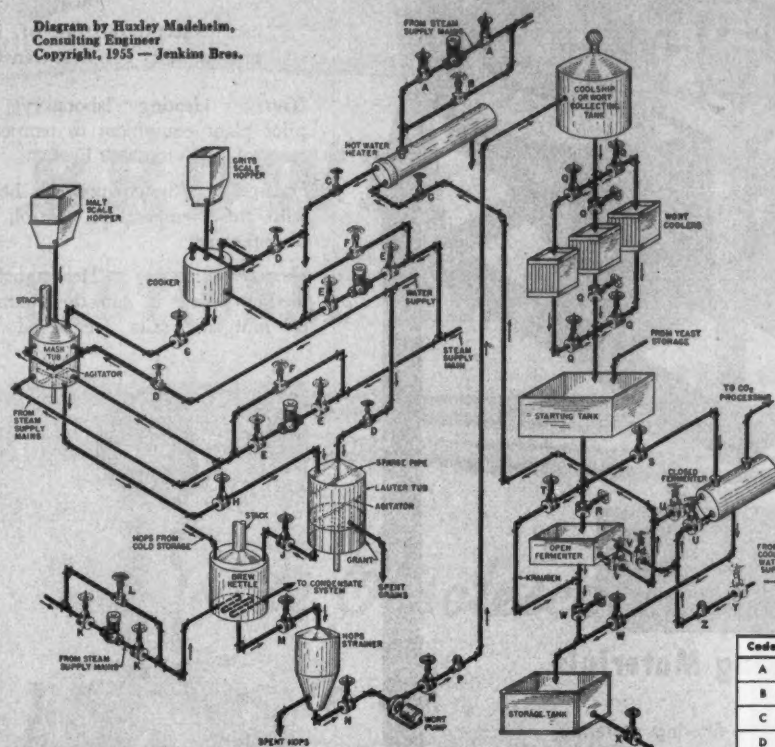
Process puzzle?

Wondering which types of equipment to use in the process you're planning or revising? Each month, CHEMICAL PROCESSING brings you news about latest developments in filters, stills, evaporators, heat exchangers, dryers, other process units. Check the alphabetical Product Directory, pages 218 to 220, to see what's discussed in this issue.

JENKINS PRACTICAL PIPING LAYOUTS

76

Diagram by Huxley Madeheim,
Consulting Engineer
Copyright, 1955 — Jenkins Bros.



VALVE RECOMMENDATIONS
For details of valves to suit varying conditions see Jenkins Catalog.

Code	Quan.	Jenkins Valve	Service
A	2	Fig. 275 Bronze Gate	Shutoff steam to heater
B	1	Fig. 556-P Bronze Globe	Bypass to heater
C	2	Fig. 47 Bronze Gate	Shutoff water heater
D	3	Fig. 106-A Bronze Globe	Continuous water flow
E	4	Fig. 204 I.B. Gate	Process steam shutoff
F	2	Fig. 576-P Bronze Globe	Bypass water valve
G	1	Fig. 677-A Bronze Gate	Shutoff cooler mash
H	1	Fig. 677-A Bronze Gate	Shutoff wort to kettle
J	1	Fig. 677-A Bronze Gate	Shutoff wort to kettle
K	2	Fig. 204 I.B. Gate	Shutoff steam to kettle
L	1	Fig. 576-P Bronze Globe	Bypass to kettle
M	1	Fig. 677-A Bronze Gate	Shutoff wort line
N	2	Fig. 677-A Bronze Gate	Pump shutoff
P	1	Fig. 352 Bronze Swing Check	Prevent backflow
Q	6	Fig. 677-A Bronze Gate	Shutoff coolers
R	1	Fig. 677-A Bronze Gate	Shutoff open fermenter
S	1	Fig. 677-A Bronze Gate	Shutoff closed fermenter
T	2	Fig. 677-A Bronze Gate	Krausen line
U	2	Fig. 675-A Bronze Gate	Water to closed fermenter
V	2	Fig. 675-A Bronze Gate	Water to open fermenter
W	2	Fig. 677-A Bronze Gate	Shutoff storage
X	1	Fig. 677-A Bronze Gate	Shutoff rack & bottling
Y	1	Fig. 675-A Bronze Gate	Shutoff well water
Z	1	Fig. 352 Bronze Swing Check	Prevent backflow

How to plan piping connections for a GRAVITY-FEED MULTIPLE-STORY BREWERY

This piping layout is typical of installations in many breweries designed for gravity-feed processing, and the principal operations are briefly outlined.

Corn grits are cooked with water in the cooker, with enough added malt to convert and liquefy the grits. When the malt, which has been mixed with water in the mash tub, is properly steeped, the finished cook is dropped into it and the resulting mash thoroughly mixed.

Pumped into the Lauter tub, the mash grains settle to form a filter bed, from the bottom of which the clear liquid containing fermentable and unfermentable sugars is drawn. Extraction is increased by "sparging" with hot-water spray. This liquid, the "wort", flows by gravity to the brew kettle.

In the brew kettle, the wort is boiled with hops to add flavor and to clarify and preserve it. The hops are then strained off, and the liquid is pumped to the "cool-ship" tank to settle. It then goes through

coolers to reclaim most of the residual heat, and on to the starting tank.

In the starting tank, the yeast is added, and the mixture flows to the fermenters, some of which are closed to collect the carbon dioxide gas for future use. After fermentation, the beer is cooled again and sent to storage tanks for eventual bottling and racking.

Consultation with accredited piping engineers and contractors, experienced in brewery design, is recommended when planning any phase of the various processing systems.

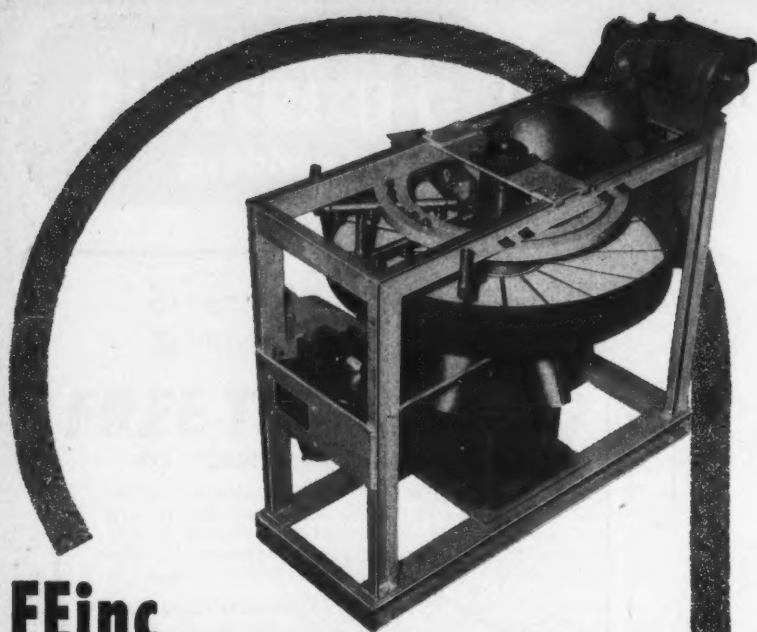
To simplify planning, select all the valves you need from the complete Jenkins line. It's your best assurance of lowest cost in the long run. Jenkins Bros., 100 Park Ave., New York 17.

Complete description and enlarged diagram of this layout free on request. Includes additional detailed information.

SOLD THROUGH PLUMBING-HEATING AND INDUSTRIAL DISTRIBUTORS

JENKINS
LOOK FOR THE JENKINS DESIGN
VALVES

When inquiring check CP 2641 opposite last page



FEinc

**HORIZONTAL
ROTARY FILTERS**

Best for Free-Filtering Materials

For continuous separation of free-filtering materials such as coarse crystalline or fibrous pulps, the new FEinc Horizontal Rotary Vacuum Filter is the simplest and fastest type available. It offers six advantages:

(1) Hourly output is extremely high; (2) Multiple-stage or counter-current washing provides maximum recovery of solubles with minimum dilution; (3) Results are always visible, easy to control; (4) Cakes can be built up to 4" or more; (5) Central-mounted drive simplifies installation and maintenance; (6) It is available with totally enclosed rubber-covered or other special constructions.

The FEinc Horizontal is only one of many continuous filters now made by Filtration Engineers, Inc. Our Engineering service is the finest available, backed by 35 years of experience, and by the ability to deliver filters that are tailor-made to fit the job . . . at no more than standard costs. Whatever the filtration problem, talk to FEinc first.

Ask for Bulletin
Filtration Engineers, Inc.

CUSTOM DESIGNERS AND MANUFACTURERS OF ALL
TYPES OF CONTINUOUS FILTRATION EQUIPMENT

FEinc

41 155 ORATON STREET • NEWARK 4, N. J.

When inquiring check CP 2642 opposite last page

PROCESSING

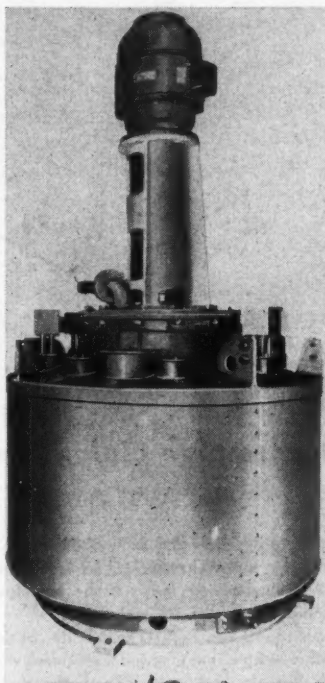
**Heats small equipment
from 650° to 1000°F,
at no pressure . . .**

uses eutectic mixture of in-
organic salts for heat-transfer

Uses: Heating laboratory or
pilot plant equipment to tempera-
tures of 650° to 1000°F.

Features: System provides heat,
with close temperature control, at
no pressure.

Description: Heat-transfer
medium used is eutectic mixture
of inorganic salts (marketed by



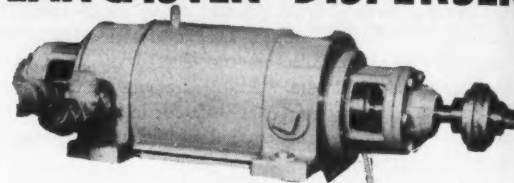
Compact heating system has salt
pump mounted directly on cover

Du Pont under name of Hi-Tec.)
System consists of an insulated
steel tank which holds the process
salt, salt pump, electrical heaters.

Heaters are stainless steel-sheathed
units, suspended from cover into
salt. Heaters may be removed in-
dividually. Systems range in heating
capacities from 10,000 to 250,000
Btu per hr, and are available in
three tank sizes (800, 1100, and
2200 lb salt capacity). Smallest
unit is 6'-6" tall and has 2'-9"
diameter.

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**Solve it
Completely with a
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through-put . . . allows controllable recir-
culation . . . cleans easily and quickly . . .
requires little maintenance.

Available for 50-5000 gal./hr. (7-7000 lbs./min.)



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CHEMICAL CORP.**

CARLSTADT, NEW JERSEY

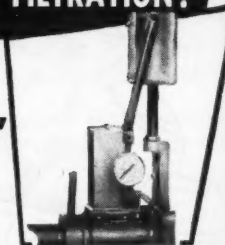
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Write for complete in-
formation and brochure.
Please state mixing prob-
lem, product, viscosity,
temperature and cor-
rosion conditions, and pre-
sent mixing method.

When inquiring check CP 2643 opposite last page

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OPERATES IN SECONDS!
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When inquiring check CP 2644 opposite last page

CHEMICAL PROCESSING

PROCESSING

Salt pump is submerged-impeller centrifugal-type mounted directly on cover. Low-temperature cut-out forestalls operation of pump until salt reaches predetermined temperature. High-temperature alarm sounds if salt temperature goes over safe limit (1000°F).

Instruments are wired into separate panel board which can be placed at any distance from main unit. System can be operated either automatically or manually. Unit can also be used for cooling by adding accessory equipment.

(Beth-Tec heating unit is product of Bethlehem Foundry and Machine Company, Dept. CP, Bethlehem, Pa. . . . or for more information check CP 2645 opposite last page.)

How to control dust in rubber industry

How to control dust in the manufacture of rubber goods is discussed in four-page bulletin. Literature cites case histories of four different companies, showing how dust conditions were remedied.

Bul 555-D is issued by Wheelabrator Corporation, Dept. CP, 1036 S. Byrkit St., Mishawaka, Indiana. When inquiring specify CP 2646 opposite last page.

Shows complete line of centrifugals

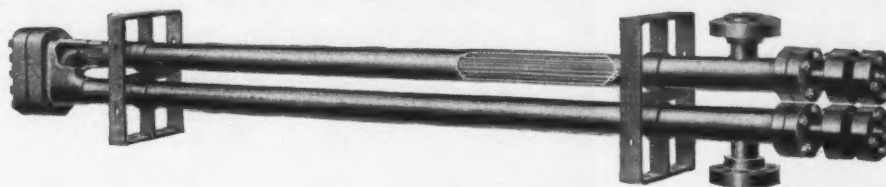
Line of centrifugal separators is described in eight-page booklet. Featuring an enclosed feed, units are particularly suitable for handling liquid mixtures having relatively high solids content.

Booklet on centrifugal separators is issued by Centrico Inc., Dept. CP, 75 West Forest Ave., Englewood, N. J. When inquiring specify CP 2647 opp. last page.

For more information on product at right, specify CP 2648 . . . see information request blank opposite last page.

Prevent this Waste!

BROWN FINTUBE SECTIONAL HEAT EXCHANGERS

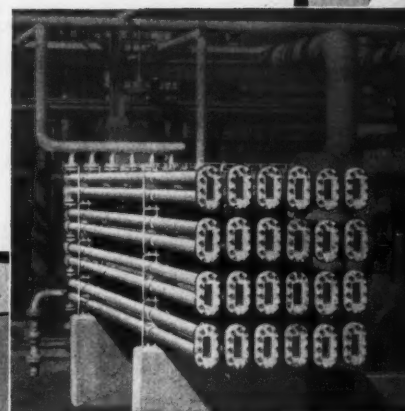


*Eliminate Obsolescence
and Waste in . . .*

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SEMI WORKS and

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● Modular design;—can be changed quickly from one product and duty to another by simply adding or removing sections or changing series-parallel manifolding. Pilot operations enlarged easily to semi-works or full plant by direct multiplication keeping all conditions in same relationship. Standard sizes. Interchangeable. Pressures to 22,000 psi. Mild steel, alloy or non-ferrous construction.

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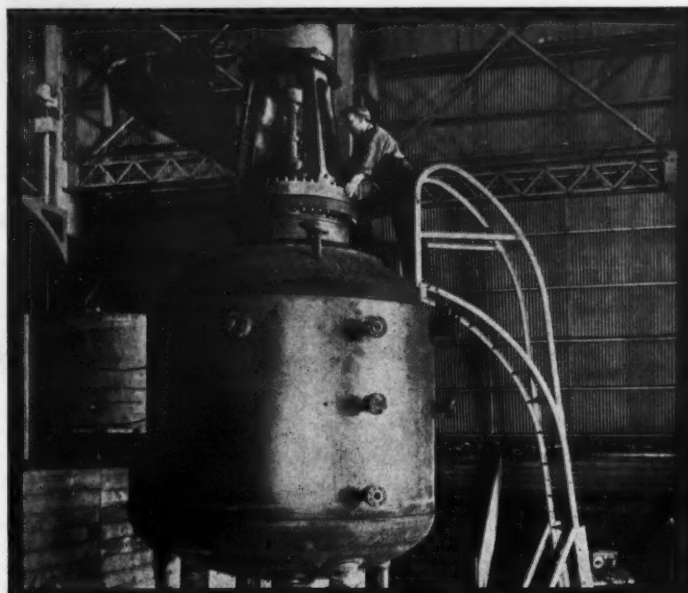
Turbo-Mixers



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flows faster
with
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Turbo Contactor For Butane Isomerization: furnished to C. F. Braun & Co., Engineers and Constructors as part of a plant built by them in 1942 for a West Coast petroleum processor.

For over 25 years, Turbo has supplied leading oil companies with precision-built mixers for petroleum processing. In many plants, the original Turbos are still in operation—after more than 20 years of continuous 24-hour maintenance-free service. This outstanding service record is a testimonial to the rugged design built into each and every Turbo. If you have a process problem, call on Turbo. A Turbo engineer is always available to work with your engineers on request.

***How the petroleum industry uses Turbo-Mixers—**Asphalt filling, asphalt oxidation, asphalt cut back blending, spent doctor oxidizing, doctor treating, drilling mud mixing, lube blending, solvent extraction and many others.

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When inquiring check CP 2649 opposite last page

PROCESSING EQUIPMENT

**More than 241 different materials
can be handled by separators**

Complete line of vibrating screen separators are pictured and described in 22-page catalog. Units can be used on more than 241 different materials. Catalog describes in detail how separators work. Specifications, photographs, drawings, and partial listing of products screened are also included.

Cat 112-3 is issued by Southwestern Engineering Company, Dept. CP, 4800 South Santa Fe, Los Angeles 58, California. When inquiring about manufacturer's product, reader may simply specify CP 2650 on form which is located opposite last page.

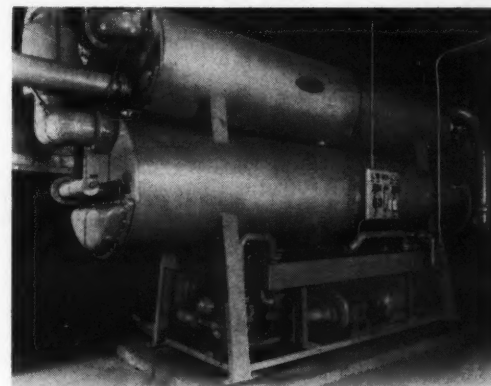
**No major moving parts present
in large capacity absorption
refrigerating units . . .**

made in 100 to 700-ton sizes, machines make chilled water from almost any source of heat

Uses: Producing chilled water. Can be applied to chilling and condensing of other products as well.

Features: Machines have no major moving parts and can produce chilled water from almost any economical source of heat. Quiet and vibrationless, units can be installed almost anywhere in plant.

Description: Absorption refrigerating machines are available in 11 sizes ranging from 100 to 700



Quiet and vibrationless, absorption refrigerating machine can be installed almost anywhere in plant

tons capacity. If steam is used as heat source, machines can operate on pressure as low as 12 psi—which may be obtained from back-pressure turbines or as exhaust from processing operations.

Compact and occupying minimum space, units adjust themselves automatically from 100 per cent to zero load and back again, with little loss in efficiency.

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PROCESSING EQUIPMENT

Machines are reported to be impossible to overload and can operate continuously for years. Maintenance is essentially nil, since the only moving parts are small solution circulating pumps and their motors. Units are governed by automatic controls and can be left unattended for long periods.

(Absorption refrigerating machines are product of Carrier Corporation, Dept. CP, 300 S. Geddes St., Syracuse, N. Y. Check CP 2651 opposite last page.)

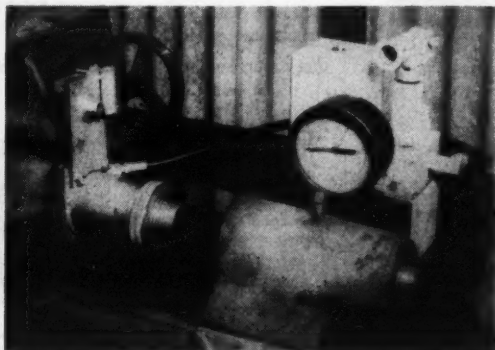
Converts mechanical filter presses to hydraulic operation . . .

device easily installed; only machining required is drilling, tapping four small holes

Uses: Closing plate-and-frame filters.

Features: Converts any mechanically-operated filter press to hydraulic operation — eliminating excess labor and reducing shutdown time.

Description: Device consists of a hydraulic ram which replaces thrust or filler block and pushes against the closing screw. Hydraulic fluid for ram is supplied by manually operated pump. All contact surfaces are chrome-plated. Unit is equipped with



Hydraulic closing device has built-in positive stop to prevent overstroking

a 4½" pressure gage mounted on top of pump. Adjustable red pointer can be set to any desired tonnage, whereby given settings may be repeated easily and quickly. Built-in positive stop prevents overstroking.

Installation is quick and simple. Only machining required is drilling and tapping four small holes to mount pump on crosshead. Bolt hole that mounts filler block is also used to mount the device. Units are available in five standard models, from 30 tons capacity with 3" stroke to 120 tons with 6" stroke. Longer or shorter stroke can be supplied on order.

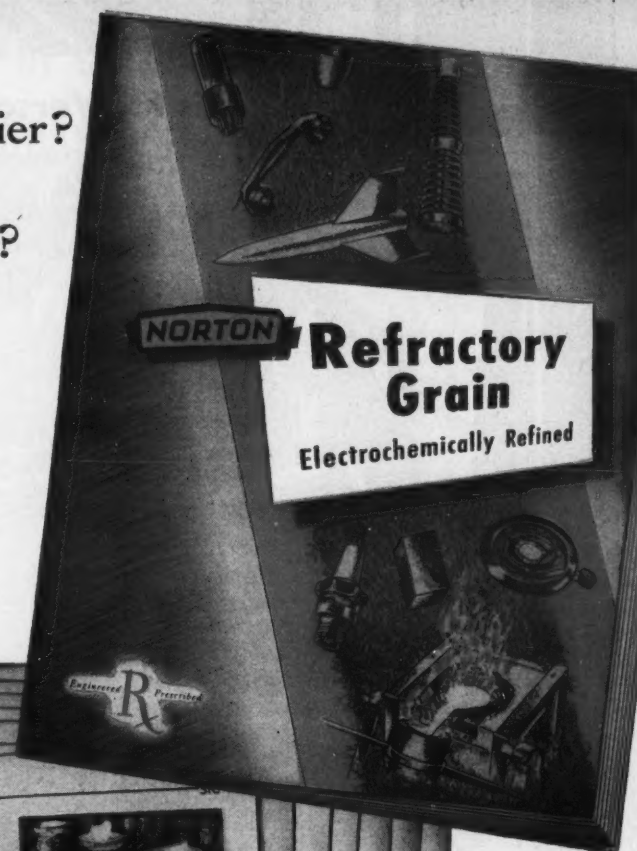
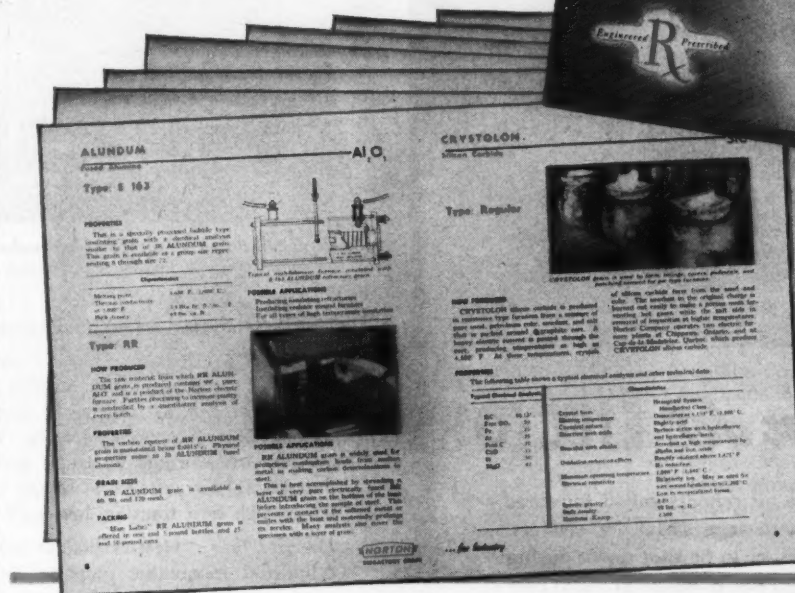
(Hydro-Lock press closer is product of Biach Industries, Dept. CP, 10 Indian Spring Road, Cranford, New Jersey. Check CP 2652 opposite last page.)

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• Looking for a High-Purity Material?

• Searching for a material with Unusual Electrical Characteristics?

You may find the answer in this new booklet on
NORTON Refractory Grain



This latest Norton publication is 8½" x 11". Twenty-four pages, with many charts, tables and photographs in color. A wealth of practical information on the nature, performance and application of refractory grains.

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to make your products better*

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When inquiring check CP 2653 opposite last page

How's this for Versatility?

One of three parallel sets of Elliott three-stage ejectors which serve primary and secondary towers. Ejectors are installed on a platform at an elevation.

ELLIOTT *Steam Jet* EJECTORS

This installation in a large oil refinery called for three parallel sets of Elliott three-stage steam jet ejectors. Parallel ejectors permit one set to be shut down during reduced rates, making for greater economy in steam consumption. They operate on 100 psig steam, maintaining vacuum on both the main unit and the secondary tower. Tower pressure is controlled by recycling gases from the third-stage ejector discharge back ahead of the first stage ejector.

Whenever vacuum is required, it pays to utilize the know-how of Elliott ejector specialists. Contact your Elliott representative or write Elliott Company, Jeannette, Pa. for descriptive bulletins.

ELLIOTT Company 

GS-1

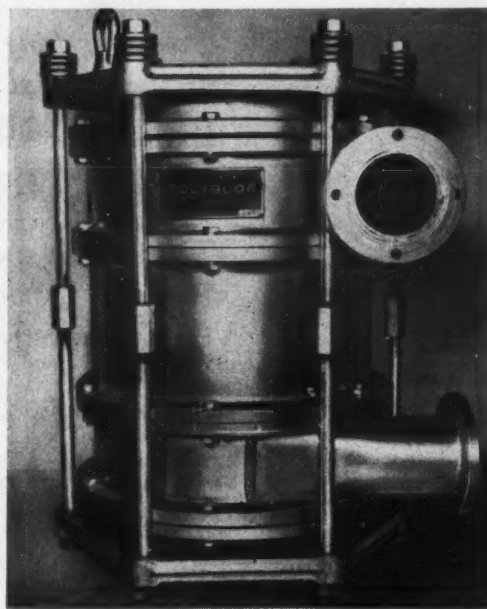
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When inquiring check CP 2654 opposite last page

PROCESSING EQUIPMENT

**Flexibility, no cemented joints
features of compact graphite
heat exchanger . . .**

heat transfer area increased or decreased easily
by changing number of graphite blocks

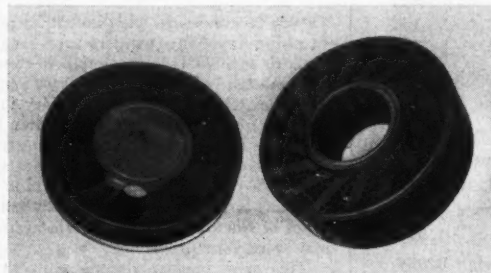


Outer casing of graphite heat exchanger consists of sectional metal ring-shaped elements bolted together

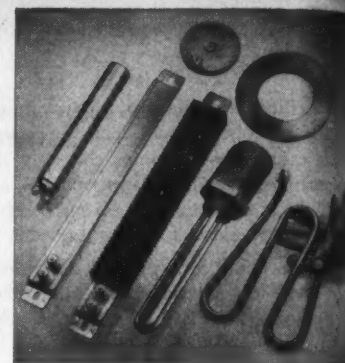
Uses: Heating and cooling corrosive fluids.

Features: Compact units have no cemented joints; corrosives contact only impermeable graphite surfaces. Heat transfer area can be easily changed by changing the number of graphite blocks. Graphite crystals are properly oriented to assure maximum heat conductivity. Short passages in blocks create high turbulence, high heat transfer, low scale or film removal.

Description: Heat exchanger consists of a pile of cylindrical monolithic graphite blocks having two sets of flow passages for the two fluids. One set is



Monolithic graphite blocks (right) have one set of flow passages parallel to axis and a second set arranged radially. Graphite header (left) is used at top and bottom of pile



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A-447A

When inquiring check CP 2655
opposite last page

CHEMICAL PROCESSING

PROCESSING EQUIPMENT

parallel to the axis and the second is arranged radially. Complete pile is held in compression by top and bottom headers (also graphite) and exterior tie bars. Outer casing of unit consists of sectional metal ring-shaped elements bolted together.

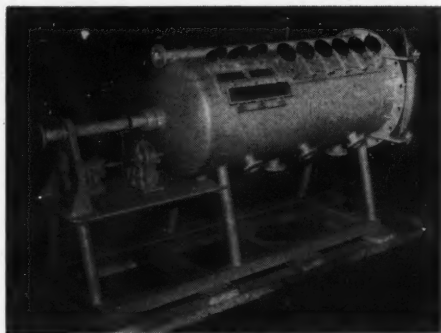
Exchangers are available with up to 20 blocks in either standard (18.988" diameter) or small (9.252" diameter) models. Two-block standard unit measures approximately 17" long and has 11 sq ft heat transfer surface. Three-block small model is about 18" long and has 3.3 sq ft heat transfer area.

(Le Carbone graphite heat exchangers are product of The Carbone Corporation, Dept. CP, Boonton, N. J. . . . or for more information check CP 2656 on form opposite last page.)

Data sheet describes packaged pilot plant

Packaged reaction-distillation pilot plant is described in two-page data sheet. Unit has 15-gal capacity and is designed for experimental work in resin manufacturing and similar processes. Schematic drawing and photographs illustrate unit and accompanying instruments.

Data sheet on 15-gal pilot plant is issued by the Patterson-Kelley Company, Inc., Dept. CP, 10 Lackawanna Ave., East Stroudsburg, Pa. When inquiring specify CP 2657 on form opposite last page.

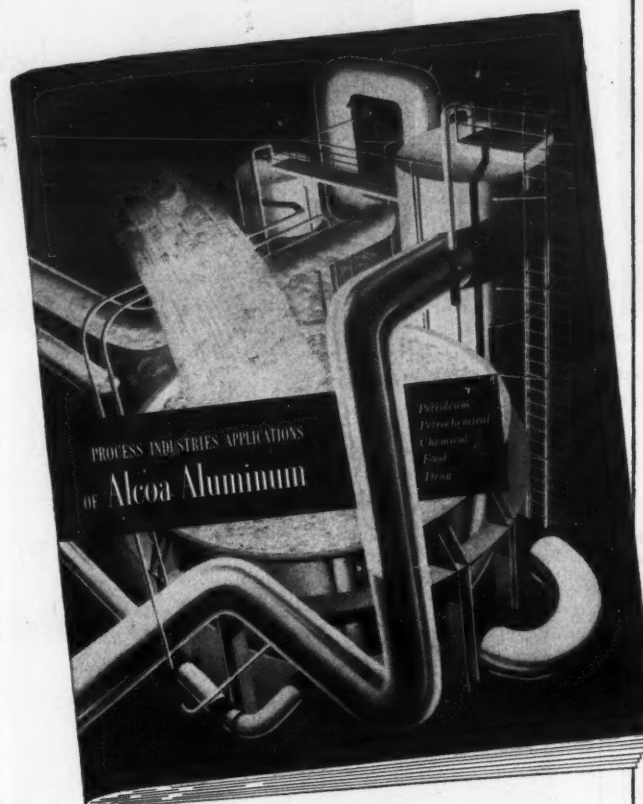


Filter has sight ports

Self-cleaning pressure-leaf filter is equipped with sight ports, permitting inspection of individual leaves. Ports can be dogged down quickly for operation of filter. Unit is capable of handling 12,000 gph.

(Self-cleaning filter is product of Hercules Filter Corporation, Dept. CP, Ethyl Avenue, Hawthorne, New Jersey . . . or for more information check CP 2658 on form opposite last page.)

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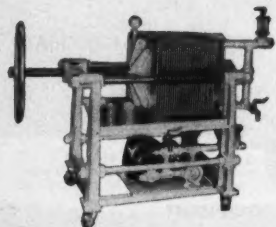
When inquiring check CP 2659 opposite last page

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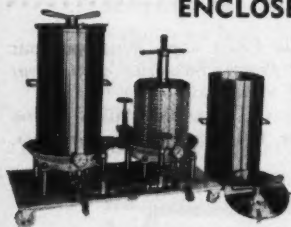
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When inquiring check CP 2660 opposite last page

for the laboratory



Ten seconds after sample is placed in arc, these six indicators show amounts of six metals directly

Makes spectral analysis in ten seconds —
can handle 120 samples per hour

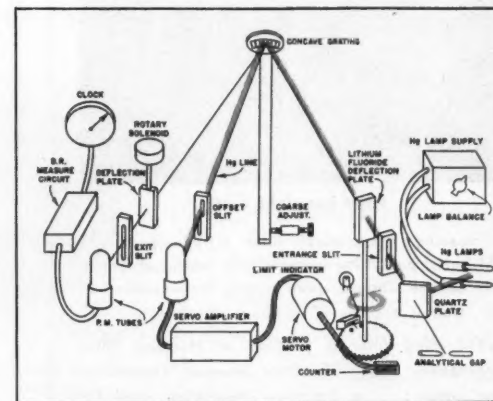
Spectroscopic analyzer works in plant environment

Its readings show amounts of six metals directly

Designed for direct metal analysis, this instrument supplants regular laboratory routines. It can be used at virtually any location in the plant — compensation and sealed construction make it insensitive to temperature and humidity changes. Dust-tight chambers protect delicate mechanisms from dust damage.

In standard set-up it analyzes for chromium, magnesium, silicon, manganese, copper, iron, and nickel. To make a simultaneous analysis for six of these metals, sample is placed between electrodes and arc light from it is split by a three-meter 15,000 line grating. In ten seconds a quantitative reading for six of these metals is available on "clocks" at instrument face.

Behind this instrument is the reasoning that laboratory instruments require a laboratory for proper



Overall schematic of analyzer shows servo-loop which corrects for differences of temperature, humidity

operation. Cost of the air-conditioned laboratory — especially where it is installed specifically for the instrument — is high enough to justify a special instrument design that can do away with need for a lab. Optical system of this design is isolated from its environment by a sealed chamber made of steel pipe. Sealed enclosure at one end houses grating; enclosure at other end has a quartz window for light entrance and house photo-multiplier tubes.

For other parts of the instrument less stringent sealing is needed. Electronic sections are sealed to exclude dust. Source unit, while not sealed, is designed to minimize effects of dust and contacts in it are covered.

Second problem of plant environment is physical shock. Shock mountings provide the obvious answer to this one.

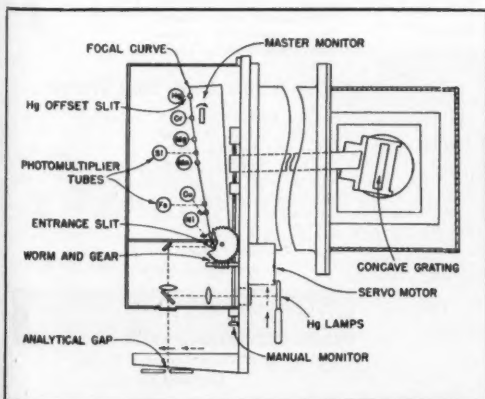
To get away from effects of varying temperature and humidity, a servo monitoring device is used. This system keeps tabs on light from mercury vapor lamps and adjusts exit slits for alignment. As this reference slit is moved (maximum movement is about 40 microns for temperatures from 66 to 92°F, humidities from 40 to 90 per cent) slits for other metal lines are moved correspondingly.

Throughout its design, this instrument shows originality rather than adaption. Mechanism of operation has been kept simple — with resultant reliability. One example of this is a circuit timer which replaces a rotary timer, four relays, and six time-delay timers in conventional laboratory units.

Optical System

Optical layout of instrument includes analytical gap, quartz entrance window, lens, mirror and entrance slit. Light then travels through steel pipe enclosure (shown foreshortened here) to grating. Grating itself is an original four-inch, 15,000

(Continued on next page)



Optical system shows grating in sealed housing

in vacuum processing . . .



Whether you need vacuum for laboratory, pilot plant, or production, it's wise to choose Kinney . . . the high vacuum pump with the capacity and stamina to handle tomorrow's vacuum requirements today. A Kinney Pump gives you rugged durability plus all-around versatility . . . it stays young and useful even after years of steady service, and is easily shifted from one assignment to another.

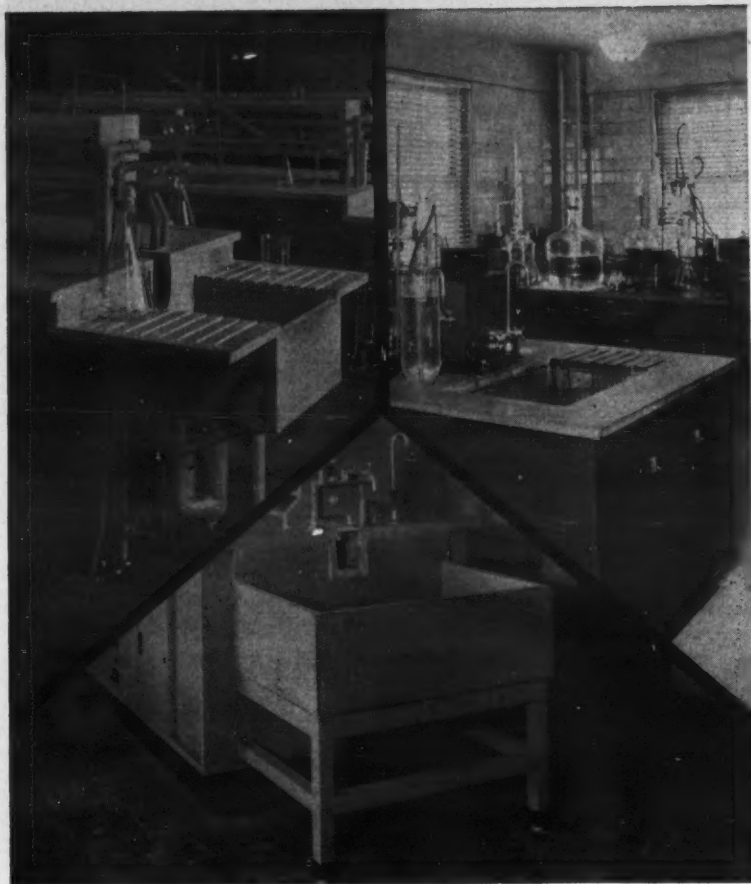
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provides LOW ABSORBENCY protection

When inquiring check CP 2662 opposite last page

FOR THE LABORATORY

SPECTROSCOPIC ANALYZER

(Continued from preceding page)

line per inch, unit with a three-meter focal length. First order spectral range of about 2000 Angstrom units is available at focal curve. Second order spectra can be set up with 1000A available.

Servo monitor is associated with optical system. It includes two mercury vapor lamps with an electrical device for balancing their light intensity. Light from these enters optics enclosure. Exit slit is located at 2536 Hg line. And a servo motor positions all slits to make the mercury slit match position with this line.

Light from the mercury lamps is produced by alternate half-cycles of 60 cps line voltage. After passing through its path within the optical enclosure light from both lamps falls on an "offset slit." Two openings of this slit, one above the other, are laterally displaced so that left edge of upper slit is over right edge of lower.

Since light from upper lamp hits upper slit, and light from lower lamp hits lower slit, light from both lamps is attenuated by slit edge — though by right edge in one case and left edge in the other. There is only one position where light passing through offset slit will be equal in both halves of the cycle. Any output other than this is amplified to drive a servo motor which positions a lithium fluoride deflection plate. Located in the incoming light beam, this plate adjusts position of entire spectrum.

(Spectromet analyzer is a development of Baird Associates, Inc., Dept. CP, 33 University Rd., Cambridge 38, Mass. . . . or for more information check CP 2663 on form opposite last page.)

Measures vapor equivalent of liquid unit-volume in ten minutes . . .

can be used with any liquid with vapor pressure of more than 4 mm at test temperatures

Uses: Rapid and easy determination of vapor equivalent in residues from natural gas samples, or any liquid with vapor pressure of more than 4 mm at test temperature.

Features: Instrument measures volume of vapor produced by unit volume of liquid in approximately 10 minutes.

Description: Apparatus consists of vaporization bulb with an integral multiplying manometer, removable sample entry system consisting of an orifice and matching pycnometer, electric heater. All components are mounted within a glass constant-temperature bath.

Procedure consists of filling the pycnometer with sample, admitting sample to vaporization bulb,

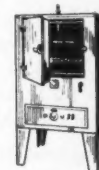


the complete line in Research Laboratory Equipment

Precision Scientific Company manufactures a COMPLETE SELECTION or more than 1500 items for use in research laboratories. Quality control and high manufacturing standards at our factory assure you of top performance on any item stamped with the "Precision" name. Always specify Precision when you order items like these:

Freas Ovens

Gravity or mechanical convection, floor, table or wall mounting types. Hazard-safe, explosion-proof and vacuum models. Also incubators, sterilizers, conditioning and annealing ovens and humidity cabinets.



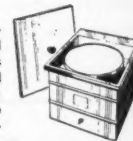
Petroleum Testing Apparatus

All types of equipment for the petroleum laboratory. Unique Front-View Distillation Units shown promote accuracy and easier use by centralizing all controls and reading instruments in front. More compact, space-saving design.



Metallurgical Hand Polisher

Ideal for small laboratories or for standardized hand polishing procedures in larger labs. Enclosed drive mechanism and lifetime sealed motor assure long, dependable operation. Exceptionally quiet.



"Time-It" Electrical Stop Watch

Large, legible indicating counter easier to read than conventional watches. Readings to 1/10 second! Can be re-set to zero from any reading or successive readings can be totaled.



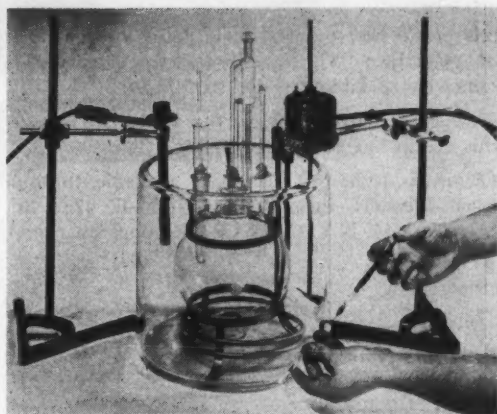
Write for free Bulletins on any of the above equipment.

Precision Scientific Company

3747 West Cortland Street
Chicago 47

When inquiring check CP 2664 opposite last page

CHEMICAL PROCESSING



Pycnometer is filled with sample to determine vapor equivalent

reading pressure on the multiplying manometer. Vapor equivalents are measured as gaseous ml per liquid ml. Sensitivity is to 1.5 ml for each ml on the manometer scale. Molecular weight can be calculated from vapor equivalent data.

(Vapor equivalent apparatus is product of Central Scientific Company, Dept. CP, 1700 Irving Park Road, Chicago, Ill. Check CP 2665 opp. last page.)

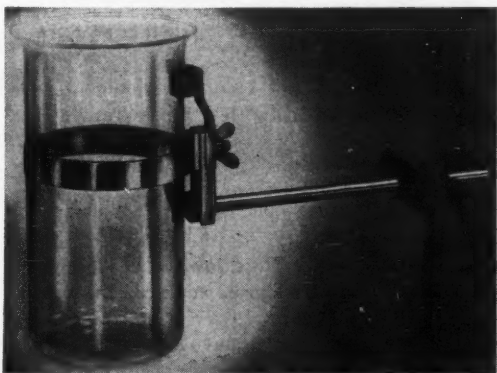
Spring steel strap clamps glass all around

Uses: Three sizes of strap clamp accommodate laboratory glassware 1 to 2" in diameter, 2 to 3", and 3 to 6" in diameter.

Features: Evenly distributed clamping pressure tends to reduce glassware breakage.

Description: Strap of spring steel encircles entire circumference of laboratory glassware. Even when tightened down, this arrangement brings

(Continued on next page)

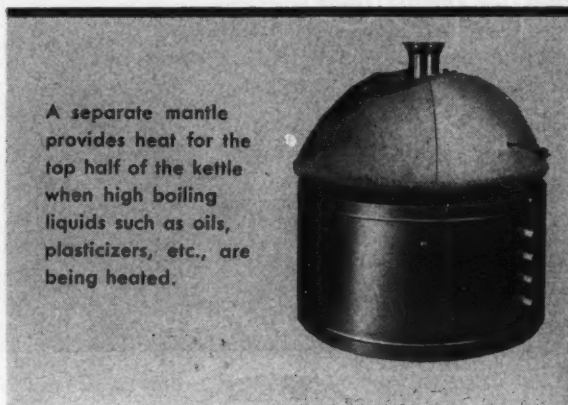
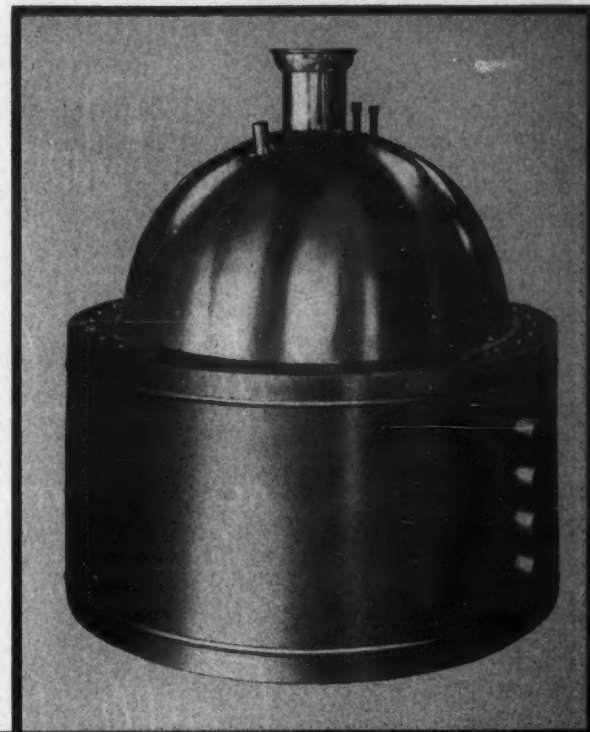


Three sizes available accommodate glassware to six inches diameter

here's the story of the New Glas-Col "R" 650° C Heating Mantle

- .. made with a newly developed, extra tough fabric
- .. designed for pilot and production plant applications

If you have a pilot or production plant application which requires controlled heating to 650° C, you'll be interested in the new Glas-Col "R" Electric Heating Mantle. The newly developed fabric used in type "R" mantles is extremely rugged, mechanically, and readily withstands heavy and punishing usage. The break-resisting and wear-resisting qualities of Glas-Col "R" mantles make them especially suitable for large kettles or receptacles used in pilot plants and production plants. Fabric breakage, which sometimes occurs with conventional 650° C quartz mantles, is almost eliminated.



A separate mantle provides heat for the top half of the kettle when high boiling liquids such as oils, plasticizers, etc., are being heated.

▲ This is a new Glas-Col "R" 650° C Heating Mantle. It was designed and built for the 35-gallon stainless steel kettle shown. Power input into the bottom portion of the mantle is 10 KW, at 220 volts . . divided into four circuits of 2½ kilowatts each. Minimum efficiency is 80%. The lowest circuit of the mantle covers a small circular area surrounding the bottom center of the kettle. The three adjacent circuits provide heat for parallel circular band areas of the kettle. As the level of the liquid being heated recedes below the half-full point, power to the upper circuits can be decreased or shut off entirely. This prevents superheating of the bare kettle wall above the level of the liquid.

U. S. Patent
No. 2,282,078



U. S. Patent
No. 2,231,506

For additional information, contact Glas-Col Apparatus Company,
Dept. CP, 711 Hulman Street, Terre Haute, Indiana

GLAS-COL

Trademark Registered U. S. Patent Office

ELECTRIC HEATING MANTLES

Specialists in Laboratory and Pilot Plant Heating Problems

When inquiring check CP 2666 opposite last page

Vinyl Acetate Monomer

from

Air Reduction Chemical Company

NEW CALVERT CITY, KENTUCKY, PLANT

on stream

Early in 1956

AT THE FRONTIERS OF PROGRESS YOU'LL FIND . . .



**AIR REDUCTION
CHEMICAL COMPANY**

A Division of Air Reduction Company, Incorporated
General Office: 60 East 42nd Street, New York 17, N. Y.
Represented internationally by Airco Company International

When inquiring check CP 2667 opposite last page

FOR THE LABORATORY

(Continued from preceding page)

pressure to bear evenly around entire circumference of glassware. While held tightly, glassware is somewhat flexible on the stand.

Now being introduced on the American market, this clamp has become popular in Europe.

(Rimenco laboratory clamp is available through R. I. Mendels, Inc., Dept. CP, 41 E. 42nd St., New York 17, N.Y. Check CP 2668 opp. last page.)

Provides convenient method for precise counting of beta samples . . .

counts isotopes with low beta energies as tritium and carbon-14

Uses: Precise low-level counting of beta-emitting samples in solution with liquid scintillators—H-3, C-14, S-35, Ca-45.

Features: Sample preparation is often simpler, faster than with solid or gas phase counting.

Description: Light-tight sample holder equipped with optical shutters allows fast and easy changing



Sample is placed in sample holder located in constant temperature unit at left. Counter is on right

in normal room light. Samples are counted in small glass weighing bottles. Bottles are 85 ml capacity or smaller. Instrument has two channels of pulse height analysis and two scalars. Number of samples that can be handled per hour is increased by second channel. In single isotope counting, second channel can be used for background monitoring. Isotopes with low beta energies as tritium and carbon-14 can be counted, either individually or in mixtures.

(Tri-Carb liquid scintillation counter is product of Packard Instrument Co., Dept. CP, PO Box 428, La Grange, Ill. Check CP 2669 opposite last page.)

CHEMICAL PROCESSING

It's **NEW** MONITOR THERMOCOUPLE CIRCUITS



DETECT and CORRECT
thermocouple cir-
cuit failures by
pushing button
on your instru-
ment control
panel.

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... CUTS MAINTENANCE COSTS**

Why depend entirely on a \$10 thermo-
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temperatures? Faulty thermocouples and
loose, oxidized or corroded thermocouple
circuit connections cause many common
pyrometer errors.

Periodic inspection and replacement of
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errors. Instead, monitor your thermocouples
and circuits with the Peerless Restorer. Users
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Saving \$1 per day for a year will repay
your firm the Restorer's usual cost. The unit
can be installed on your instrument panel,
recording errors and corrections on your
pyrometer chart. No tubes. Simple electrical
circuits require no maintenance.

**ONE RESTORER MONITORS
MANY THERMOCOUPLES**



ELECTRONICS DIVISION
THE PEERLESS ELECTRIC CO., WARREN, OHIO
Please send me free catalog R-22

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Firm _____
Address _____
City _____ Zone _____ State _____

When inquiring check CP 2670
opposite last page

FOR THE LABORATORY

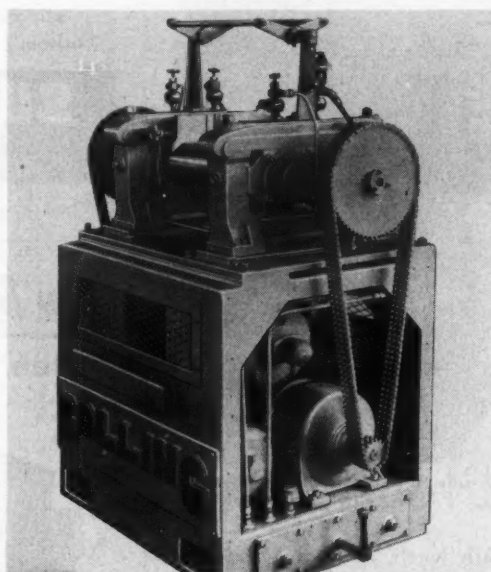
**Ingenious motor arrangement
puts two in same space
as one . . .**

dual motor lab mill has 8:1 speed control of
either roller independently

Uses: Can be used for ink, pigment, and other
usual laboratory milling tests.

Features: Separate motors are used to drive two
rolls. Speed of either roll is infinitely variable in-
dependently of the other to a range of 8:1.

Description: Two-roller, 6 x 12" laboratory
mill achieves compactness by mounting one of its
two motors in an inverted position. Floor space
requirement for the two-motor mill is no larger
than that for conventional one-motor mill. Direct
current, used for controlled speed motors, is sup-
plied by an electronic rectifier.



Two-motor mill is shown here with guards and sides
removed. Note motor mounting which saves space

Full flood lubrication is used on roll journals. Oil
pressure is maintained by separately motorized
pumping unit contained within the same space.
Designed for use where wide ranges of speeds and
friction ratios must be attained, mill is capable of
operation continuously at high temperatures.

Complete with motors, mill weighs approximately
2400 lb. Triple-strand silent chain is used on
drive. Overall dimensions of the mill are 56 x 30 x
61" high.

(Dual-motor laboratory mill is manufactured by
Stewart Bolling & Co., Inc., Dept. CP, 3190 E.
65th St., Cleveland 27, Ohio . . . or for more in-
formation about manufacturer's product reader may
simply check CP 2671 on form which is located
opposite last page.)



Industrial Mass Spectrometry

*Here's how it
pays off
in sulfur
recovery*

By reporting around-the-clock on the concen-
tration of H₂S and SO₂ in sulfur-extraction
plant tail gas, CEC's Type 21-610 Mass Spec-
trometers pay off in two important ways. By
means of its continuous, accurate monitoring,
the ratio of the two gases in the stream can be
controlled within critical limits, which increases
the profitable elemental sulfur output by as
much as 1½ tons per day in a typical plant.
And, important to community relations, air pol-
lutants are reduced to an absolute minimum, for
when the ratio is just right, the release of harm-
ful, irritating sulfur compounds to the atmos-
phere is practically eliminated.

Now . . . two process-monitoring mass spectrometers

*For monitoring
and controlling
streams to mass 80*

TYPE 21-610 is moderately priced and a truly
general-purpose instrument. Although primarily de-
signed for continuous petroleum and petrochemical
stream analysis, it is also valuable for production-
line leak detection or laboratory analysis. Its appli-
cations have ranged from on-the-spot acetylene-
plant monitoring to hospital clinical tests on lungs.

*For higher resolution
power and readings
to mass 150*

TYPE 21-620 has the highest mass range of any
instrument in its compact size range. Using the new
"Cycloidal Focusing" principle, it goes beyond the
21-610 for accurate readings from mass 2 to mass
150. Medical laboratories, petrochemical plants and
general research organizations will all find it ideal
for their analytical problems.

Send for Bulletin CEC 1824A-X29.

Consolidated Engineering Corporation

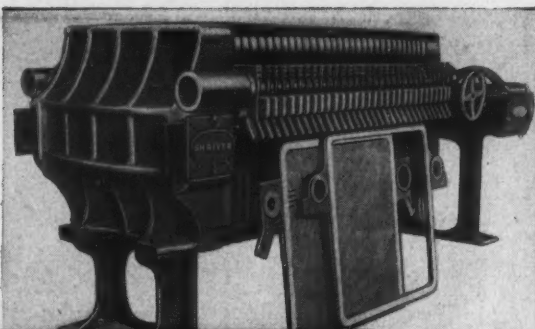
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Sales and Service Offices Located in: Albuquerque, Atlanta, Buffalo, Chicago, Dallas,
Detroit, New York, Pasadena, Philadelphia, San Francisco, Seattle, Washington, D. C.

When inquiring check CP 2672 opposite last page

**Learn
Why
It PAYS
to Use**



Shriver Filter Presses

Next time you need a filter in your process, investigate the Shriver Filter Press—its range of types and capacities to meet practically all conditions of operating pressure and temperature, required clarity and flow rate of filtrate, degree of cake dryness, ability to extract or wash filter cake, ability to use any textile, metal or paper filter media.

Thousands of plants the world over use and reorder Shriver Filter Presses because there's an economical unit for every filtration need—from laboratory to large-scale operation.

Catalog No. 55 will be gladly sent on request.

T. SHRIVER & COMPANY, Inc.

Filter Presses • Filter Media • Diaphragm Pumps

846 Hamilton St., Harrison, N. J.

Sales Representatives in
Decatur, Ga.—Houston, Tex.—St. Louis, Mo.
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When inquiring check CP 2673 opposite last page

A SYNCHRONIZED PICTURE... Of Your LABORATORY

METALAB Equipment synchronizes laboratories by:

INTEGRATING PERSONNEL MOTION into an efficient laboratory layout... saves job time.

COMBINING STANDARDIZED UNITS with a customized installation... saves planning expenditures.

COORDINATING MECHANICAL SERVICES with maximum utility and economy... saves construction costs.

Our complete line of Sectional Units designed for interchangeability and flexibility assures you a synchronized installation which will produce peak laboratory efficiency.

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Free
WRITE TODAY
For Metalab's new
180 page catalog
on Laboratory
Equipment and Furniture.

When inquiring check CP 2674 opposite last page

LABORATORY

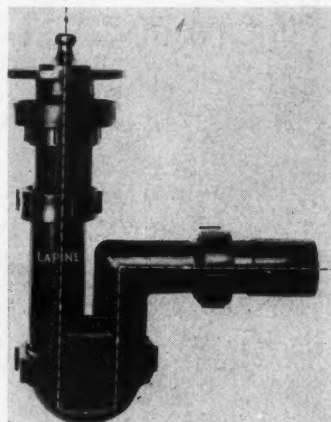
**Redesigned sink trap
has all parts
visible...**

all polyethylene construction,
can be disassembled by hand

Uses: As a trap for laboratory sinks where corrosive material would damage metal.

Features: Redesigned plastic sink trap makes all parts visible from exterior. Any damage to outflow pipe can be readily seen without dismantling trap.

Description: All polyethylene construction is resistant to acids, alkalis, mercury, other chemicals. High-molecular-weight polyethylene used in construction is phys-



Trap is equivalent of 1 1/2-inch
NPS pipe

cally tough, yet flexible. Trap can be installed or disassembled without tools. Basic parts are outflow pipe, lock nut, trap, and outlet union. Strainer and plug with interchangeable high-level drain are furnished with each trap.

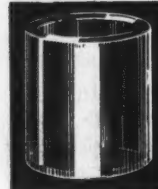
Trap is easy to connect to 1 1/2 NPS pipe. Outlet union will accommodate insert adaptors for connection to polyethylene pipes. Cup-like locknut enables trap to be installed on thin metal sinks (16 gage — 0.063") or on stone or ceramic sinks as thick as 1-7/8".

(Type P plastic sink trap is a development of Arthur S. La Pine & Co., Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. Check CP 2675 opposite last page.)



SWIFT

carries a complete stock of



GAUGE GLASS and CYLINDERS

**Need Gauge Glass or Cylinders in a hurry?
Then write, wire or phone Swift for immediate delivery.**

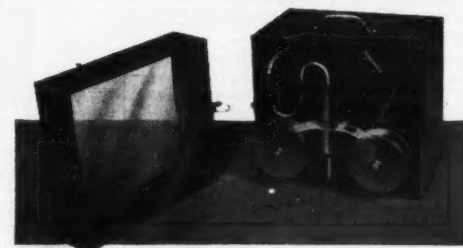
We have a complete stock of Pyrex Tubular Gauge Glass and Cylinders on hand for chemical, pharmaceutical or industrial applications. Supplied in any length or finish from 2 mm. O.D. to 7" O.D.

SWIFT Glass Division

SWIFT LUBRICATOR COMPANY, INC., ELMIRA, N. Y.
807 Mateda St., Los Angeles • 140 Boylston St., Boston 16

When inquiring check CP 2676 opposite last page

How Much H₂S Concentration in the Air Around Your Plant?



**You can measure it with the
A. I. S. I.**

Hydrogen Sulfide Sampler

The hydrogen sulfide sampler was designed to provide a device that could continuously monitor atmosphere having a house paint blackening potential. Its sensitivity is so great, however, that it also indicates much lower concentrations than believed significant in paint blackening.

It measures H₂S concentration as low as one part per billion parts of air, and can be regulated to record at intervals of 1/2 hour, 1 hour or 2 hours as desired. For descriptive literature and prices write to:

RESEARCH APPLIANCE CO.

143 Cemetery Lane • Pittsburgh 9, Pa.

When inquiring check CP 2677 opposite last page

CHEMICAL PROCESSING

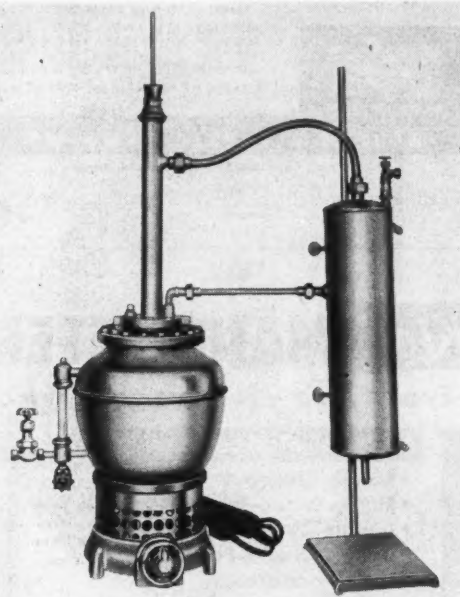
**Are you using large amounts
of laboratory solvents?
Recover them . . .**

use one-gallon solvent recovery still for carbon
"tet" or other solvents

Uses: Recovering laboratory solvents as carbon
"tet", petroleum ether, gasoline, alcohol, benzene,
other extraction vehicles and solvents.

Features: Still is designed to recover very
volatile solvents and has a 3-heat control switch.

Description: Apparatus consists of a one-gallon
retort with a distilling column, a water-cooled
condenser of the Hallock model but modified to
contain two separate tubes. Main tube serves as
the condenser and the other acts as a preheater
for the raw solvent.



One-gallon still has condenser coil of block tin

Retort is made of spun copper, and the distilling
column is seamless brass. Condenser water-jacket
and pre-heating tube are copper; condenser coil
is block tin alloyed with silver. All fittings and
valves are brass, except inlet feed valve which is
bronze. Hot plate uses nickel-chromium ribbon
elements imbedded in a refractory substance. Over-
all height is 29" and weight is 35 lb. Two models
are available, one for 115v AC/DC, 660 watts,
and the other for 230v AC/DC 660 watts.

(Precision Solvent Recovery Still is a product of
Precision Scientific Co., Dept. CP, 3737 W. Cort-
land St., Chicago 47, Ill. . . . or for more informa-
tion about manufacturer's product, reader may
simply check CP 2678 on form which is located
opposite last page.)

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THAN THE FINEST WIRE MESH . . . A CELITE FILTER CAKE!



With Celite Filtration you are assured perfect clarity

HERE is a clarification method which
can remove even the finest suspended
solids . . . a Celite* Filter Cake contains
more than 2,500,000 filter channels per
square inch of surface. Here, too, is a
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capacity, with the degree of purity and
clarity required.

Celite powders may be used with any
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steps are required. First, a "pre-coat" of
Celite is deposited on the filter medium.
Second, small amounts of Celite are
added to the solution, to form a con-

tinuously fresh filter surface. To meet
different filtration requirements, Celite
is available in nine standard grades of
microscopically controlled particle size.
Utmost uniformity is assured by exclu-
sive processing techniques.

The extraordinary efficiency and flex-
ibility of Celite Filtration have made it
the standard for entire industries. For
perfect clarity in food products such as
jellies, sugar, wine, beer . . . for highest
purity in antibiotics . . . for removal of
impurities from chemicals, petroleum,
dry cleaning solvents . . . Celite offers
unequalled advantages.

If you want to improve your present
filtration system or find an economical
way to utilize filtration in your process-
ing, investigate the Celite method now.
One of the Johns-Manville Celite Filtra-
tion Engineers will gladly discuss your
problem. These men are backed by com-
plete technical services and the Johns-
Manville Research Center, largest labo-
ratory of its kind in the world. For further
information write Johns-Manville, Box
60, New York 16, N. Y. In Canada, 199
Bay Street, Toronto 1, Ontario.

*Celite is Johns-Manville's registered Trade Mark
for its diatomaceous silica products.



Johns-Manville CELITE FILTER AIDS

When inquiring check CP 2679 opposite last page



There are Qualities
Behind ANNIN VALVES
you'll never find
in imitations



ANNIN DEVELOPED AND INTRODUCED: SPLIT BODY
DOMOTOR OPERATOR • TEFLON SEAT SEAL • DOOLSEAL
ANNIN Control VALVES THE ANNIN COMPANY
6870 East Telegraph Road
Los Angeles 22, California

50%
WITH
INVENTORY

When inquiring check CP 2680 opposite last page

NEW MANUAL X-Y PLOTTER KEYBOARD

IMPROVED PERFORMANCE
IN SUPPLYING INPUT
SIGNALS FOR AUTOMATIC
POINT PLOTTERS



A major innovation in this new Librascope manually operated decimal keyboard eliminates sticking switch contacts and high contact resistance. Self-wiping slide-type contacts eliminate necessity for any switch and contact adjustments. Resistance potentiometers are simulated by two voltage dividers—one each for the X and Y axes. All keys are released automatically after point is plotted. A variety of contact configurations available for manual feeding of decimal or binary coded decimal inputs to computer or other systems.

Write for catalog information.

FEATURES

DIMENSIONS—8½" wide;
11" deep; 16" high.

WEIGHT—12 pounds.

POWER—Energized by voltage
from recorder. No external
source required.

Computers and Controls

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A DIVISION OF GENERAL PRECISION EQUIPMENT CORPORATION

LIBRASCOPE INCORPORATED 1607 FLOWER ST. • GLENDALE, CALIF.

When inquiring check CP 2681 opposite last page

LABORATORY

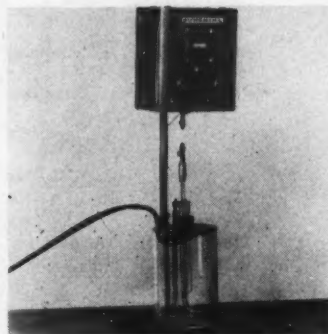
Measures gel time
by viscosity drag
of sample . . .

switch is thrown at gel time
and sounds buzzer

Uses: To identify gelatin point
of thermosetting resins, mono-
mers, varnishes.

Features: Instrument stops auto-
matically when gel point is reached.

Description: Meter consists of
motor-driven, rotating spindle



Sudden viscosity increase gives
gel-time measurement

suspended in test sample. Sample
is maintained at constant tempera-
ture by bath. Pronounced increase
in viscosity at gel point stops ro-
tating spindle, closing electrical
switch to actuate timing and alarm
circuits. Meter reads to nearest
0.1 min.

(Automatic gel-time meter is
product of Sunshine Scientific In-
strument, Dept. CP, 1810 Grant
Ave., Philadelphia 15, Pa. Check
CP 2682 opp. last page.)

Shows roulette wheel for pH checking

Feature of four-page bulletin of
test kits is a "roulette compara-
tor" for wide pH range checks.
Standards and samples are
shown mounted in a rotatable
ring.

Bul G-1-55 is issued by La
Motte Chemical Products Co.,
Dept. CP, Towson, Baltimore
4, Md. When inquiring specify
CP 2683 opp. last page.

BLUE M WATER BATH NEEDS NO STIRRER! Has built-in magnetic pumping action

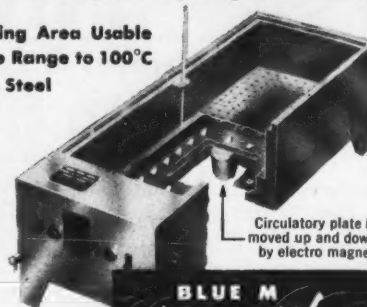
100% Working Area Usable
Temperature Range to 100°C
All Stainless Steel

UNIFORMITY
UNDER ± 1/4°C

AUTOMATICALLY
SELECTS AND
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NO REPAIRS
NO OILING
SAVES TIME
AND MONEY

Write for full data



Circulatory plate is
moved up and down
by electro magnet

BLUE M
Magni Whirl



BLUE M ELECTRIC COMPANY

138th and Chatham St., Blue Island, Illinois

When inquiring check CP 2684 opposite last page

Model	Working Space (in.)	Price
MW-1110	12 L 7½ W 7½ D	\$137.50
MW-1120	18 L 12 W 7½ D	197.50
MW-1130	30 L 12 W 7½ D	287.00
MW-1140	30 L 18 W 9½ D	375.00

Standard voltages—115 or 230V.—all models

King MANOMETERS Every Size — for Every Service

U-Type Manometers

- Single Cleanout
- Single Gland-Packed
- Double Cleanout
- Double Gland-Packed
- High Pressure

Low in price
Trouble-free
Easy to install
and read

Well-Type Manometers

- Low Well
- Raised Well
- Barometric Reading

Stay clean
longer
Easy to service

Multi-Tube Manometers

- Multi-Well
- Common-Well
- Special-Purpose

FREE LITERATURE gives sizes, con-
struction and prices. Write today! And ask for
informative 12-page Manual on Manometers.

KING ENGINEERING PRODUCTS include King-Gages — Manometers — Self-
Closing Push Valves — Pressure Transmitters — Sight Feed Bubbler —
Overflow Check Valves — Air-Flow Snubbers
— Sediment Traps — Moisture Indicators



KING ENGINEERING CORP.

Box 270 • Ann Arbor, Mich.

REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 2685 opposite last page

CHEMICAL PROCESSING

Maintains uniform temp in two ranges

Levels from 5° above freezing to 50°C held
in BOD test unit

Uses: For BOD tests and other similar tests
as well as storage in pharmaceutical, bacteriological,
medical, dairy or biochemical labs.

Features: Unit has two operating ranges—low
range from 5° above freezing to 5° above room,
high range from 5° above room to 50°C.

Description: Upright cabinet unit has space
for 150 BOD bottles. Circulation is provided by
non-sparking motor-driven blower. Heaters are



Cabinet operates in two ranges, has space for 150
BOD bottles

of ceramic type, minimizing danger of explosion
from vapor fog. Electrical contacts are outside
cabinet.

("Dual Range" unit is product of Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. . . or for more information check CP 2686 on form opposite last page.)

Check the handy product directory, pages 218 to
220, for more laboratory items. All products and
ideas discussed in this issue are listed.

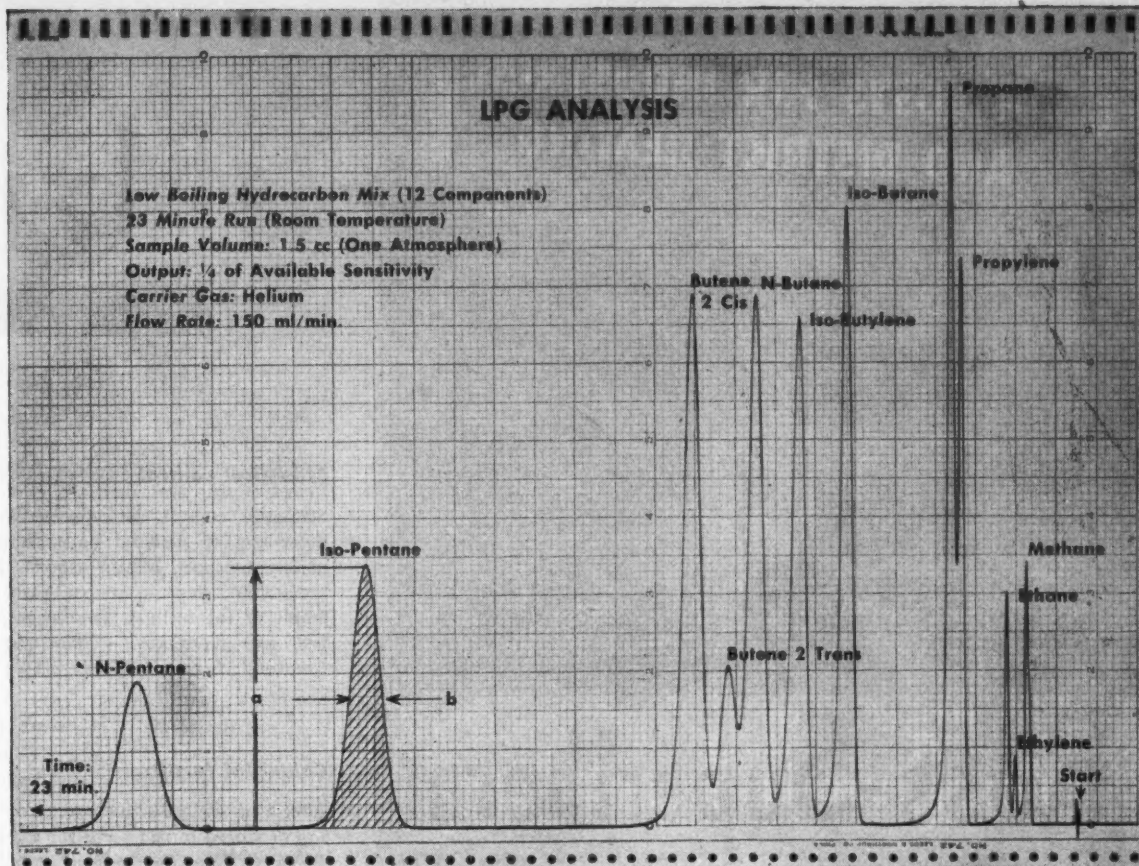


Photo of actual run made on new P-E Vapor Fractometer. To find mole % concentration of a component,
analyst simply integrates area under peak by multiplying peak height (a) times half-band width (b).

This quantitative analysis took only 23 minutes

on the new P-E Vapor Fractometer that costs only \$1,375

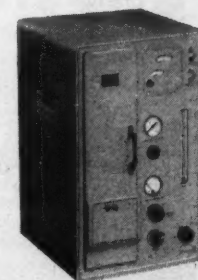
HOW LONG WOULD IT TAKE YOU?

Employing the principles of gas chromatography, P-E's new vapor fractometer is a revolutionary advance in the field of gas and volatile-liquid quantitative analysis. It is fast, precise, uncomplicated to operate, extremely simple in calculation, and above all, many times less expensive than distillation columns, mass spectrometer, or any other instrument for the purpose.

For qualitative analysis, the instrument gives extremely clean separations—even of components and isomers which cannot be separated by ordinary methods. For trace analysis, high sensitivity permits use of extremely small samples.

Take, for example, the analysis of a synthetic LPG mix shown above. Here 12 components, representing the hydrocarbons most frequently encountered, were clearly separated—a job extremely difficult to accomplish by ordinary vacuum distillation methods. The perfect shape of the recorder bands makes quantitative analysis simple and accurate. Area under each peak is the measure of the mole % concentration of the component. These area relationships are all that is needed for calculation, without preliminary calibration for each individual component.

There is no faster, no simpler, no more inexpensive method in existence today.



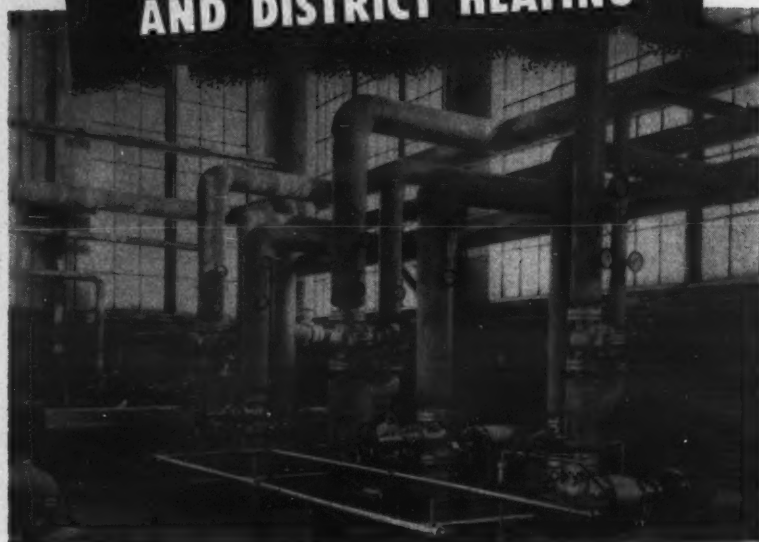
This is the Model 154
Vapor Fractometer—
price, \$1375.00 without
recorder. Send for descriptive bulletin.

Perkin-Elmer CORPORATION

Norwalk, Connecticut

When inquiring check CP 2687 opposite last page

CUT COSTS FOR INDUSTRIAL AND DISTRICT HEATING



Ross-Supertherm

High Pressure Hot Water Heating

Registered



U. S. Pat. Off.

The simplicity and economy of the ROSS Supertherm High Pressure Hot Water System is now recognized throughout industry. By replacing the use of costly steam with High Pressure Hot Water for other than power, leading manufacturers are effecting fuel savings ranging from 15% to 30% and more along with substantially lower operating and maintenance costs. Furthermore they are bettering the quality of their finished product by a more uniform temperature control.

High Pressure Hot Water Heating is in successful use in all industries for space and process heating. It is widely used as the heat carrier in district heating and for distributing heat to scattered buildings such as airfields, hospitals, colleges, etc.

Write For This Bulletin....

Completely describes the system, its features and applications, charts, heat loss comparisons, etc. Ask for Bulletin 300 C.



J. O. ROSS ENGINEERING
CORPORATION
MANUFACTURERS OF AIR PROCESSING SYSTEMS

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NEW YORK 22, N. Y.

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ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

When inquiring check CP 2688 opposite last page

briefs

from contemporary publications

Statistical control

Statistical control in continuous chemical processing is analyzed under headings of quality concepts, human aspects, points of application, steps in control plan, and example of the method. Four pages, one figure, five references. ("Industrial Quality Control," August, 1955, page 19.)

Caking of fertilizer

Effects of surface-active agents on the caking of stored mixed fertilizer are reported. Benefits from use of surfactants depend upon manufacturing methods, raw materials, and processing equipment. Four pages, seven figures, two references. ("Journal of Agricultural and Food Chemistry," August, 1955, page 669.)

Clay slurries

How to handle coating clay slurries is revealed under headings of storage, make-down, hopper bottom shipments, unloading methods, and comparative costs. Isometric and other layouts are included. Three pages, two tables, four figures. ("Southern Pulp and Paper Manufacturer," August, 1955, page 35.)

Water clarifiers

Aspects of the design of water softeners and clarifiers include derivation of modern units, seeding in chemical reactions, separation of solids from treated water, flow rates, contact units for solids, and surges in unit loading. Design equations based on Stoke's Law are presented. Seven pages, nine figures, seven references. ("Water and Sewage Works," August, 1955, page 342.)

Stainless Steel

Desirable mechanical properties for Crucible HNM stainless steel intended for high-temperature service are attained by heat treatment. Best balance of strength and ductility is achieved with a solution temperature of 2000°F and with oil quenching. Stress rupture and tensile properties are tabulated. Three pages, four tables, one figure, three references. ("Iron Age," September 29, 1955, page 65.)

Survey of valves

Control of fluid flow with left, check, angle, gate, globe, swing check, lap, and relief valves is presented in chatty story form. Four pages. ("Heating, Piping, and Air Conditioning," September, 1955, page 126.)

Superpurity aluminum

Measurements of electrical resistivity, X-ray line breadth, and hardness aid in recovery of superpurity aluminum. These properties regain at different rates and show different activation energies. Recrystallization is studied by means of a micrographic method. Twelve pages, six tables, 24 figures, 30 references. ("Journal of Metals," Section 2, Sept., 1955, page 1053.)

Freon 12

Data, plots, and equations represent the latest research on the thermodynamic properties of Freon 12, dichlorodifluoromethane. Thirteen pages, seven tables, four figures, 13 references. ("Refrigerating Engineering," September, 1955, page 32.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service to you . . .

Role of sodium in plastics

Use of sodium in preparing monomers, polymers, plasticizers, and stabilizers is outlined. Sodium and sodium-potassium alloy (Na-K) as heat transfer media, and the handling of sodium are discussed. Four pages, three photographs, 19 references. ("Modern Plastics," August, 1955, page 150.)

Heat transfer

Data for natural convection to cold horizontal cylinders surrounded by hot fluids are correlated. Substantial agreement with data for natural convection from warm horizontal cylinders to cold fluids is demonstrated. Four pages, one table, two figures, four references. ("Industrial and Engineering Chemistry," August 1955, page 1547.)

Dyeing Dacron and Nylon

Orthophenylphenol and other carriers for dyeing Dacron are reviewed and removal of residual carrier by heat treatment is covered. Applications of Capracyl dyes and leveling salt to spun Nylon are included. Five pages, two tables, seven figures, nine references. ("American Dyestuff Reporter," September, 1955, page 662.)

Engineering education

The committee on the evaluation of engineering education, appointed by the American Society for Engineering Education, recommends strengthening of work in mathematics, chemistry, and physics and the development of high levels of performance in oral, written, and graphical communications. Thirty-five pages. ("Journal of Engineering Education," September, 1955, page 25.)

Atomic heat

The familiar problems of high temperature, pressure, heat transfer, and circulation confront designers of boilers when they abstract heat from atomic reactors. Six pages, seven figures, three references. ("Power," August, 1955, page 96.)

Lithium

A series of papers on the lithium industry deals with expansion to meet current demand, pegmatite, supply of product, profitable processing of lithium, and its versatility. Lithium deuteride may be the key to peacetime electrical power. Fifteen pages, four figures, eight tables, eight photographs. ("Engineering and Mining Journal," September, 1955, page 75.)

High-analysis fertilizers

Hydrolysis of metaphosphate is basic to production of high-analysis fertilizers. Any common P, P-K, N-P, or N-P-K ratio can be attained by proper methods. Procedures that cover enriched superphosphate and mixed fertilizers are described. Three pages, two figures. ("Farm Chemicals," September, 1955, page 38.)

Industrial filtration

From England comes a discussion of the theory of filtration and six steps preliminary to industrial filtration: settling, decanting, and thickening; classifying and separating slime; adjusting temperature and reducing viscosity; adjusting pH; flocculating, coagulating and other chemical conditioning; and adding of filter aid. Three pages, two figures, 10 references. ("The Industrial Chemist," September, 1955, page 452.)

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We'll Weave It!*

WIRE CLOTH BY

Ludlow-Saylor

Oldest manufacturer of precision wire cloth woven of specified metals for every industrial filtering, straining and sizing operation. Consult our engineers without obligation.

GET YOURS!

Data Book to aid in selecting and ordering wire cloth and screen for every purpose.

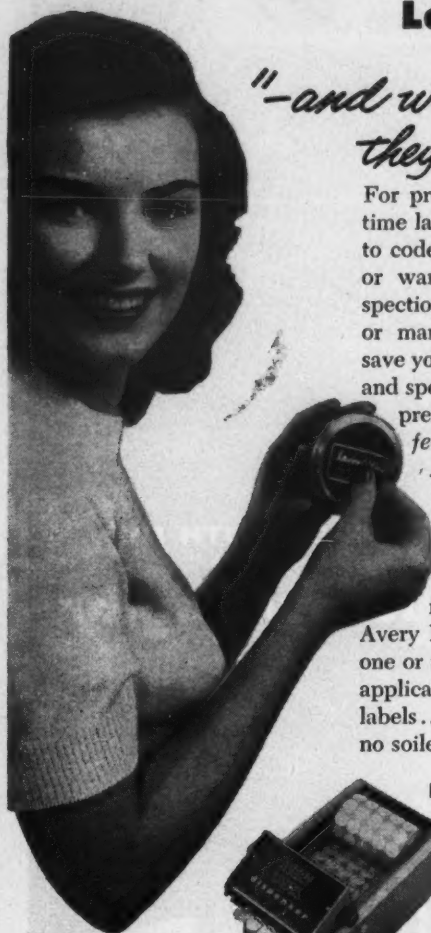
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Sales Offices: Birmingham, 921 Eighth Avenue; Chicago, 5807 W. Diversey Avenue; Pittsburgh, Union Trust Building; West Coast, Star Wire Screen & Iron Works, Inc., 7515 San Fernando Rd., Los Angeles. Subsidiary, Ludlow-Saylor Wire Cloth Co.

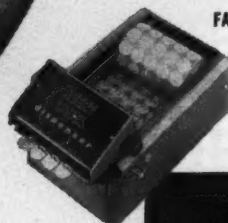
When inquiring check CP 2689 opposite last page

Speed production labeling, save time and money with Avery pressure-sensitive Labels...



*"-and what a difference
they make!"*

For production line work, or one-at-a-time labeling jobs—wherever you need to code, identify or label...in shipping or warehousing—in engineering, inspection or research—in maintenance or management...Avery Labels can save you time and money—can simplify and speed your work. That's why Avery pressure-sensitive Labeling is *different*...practical and economical! Avery's new dispensers—either manual or electric—are available to make your labeling even more efficient...to speed every type of labeling job—whether it's a single item or a thousand. Avery Labels are applied dry and fed, one or more at a time, ready for instant application. There's no sorting of loose labels...no messy glueing or licking...no soiled, spoiled packages.



FAST, SIMPLE, AUTOMATIC LABELING WITH NEW AVERY '55 ELECTRIC DISPENSER.

Individually die-cut labels are automatically fed from rolls. As fast as one label is used, another pops out. Ask now for a demonstration...there's no obligation.

KUM-KLEEN
when you want
a REMOVABLE
label.

PERMA-GRIP
when you want
a PERMANENT
label.



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PRESSURE-SENSITIVE

LABELS

Write now for details—
Free sample labels and case histories!

☐ Send me free samples and information on Avery Pressure-Sensitive Labels.

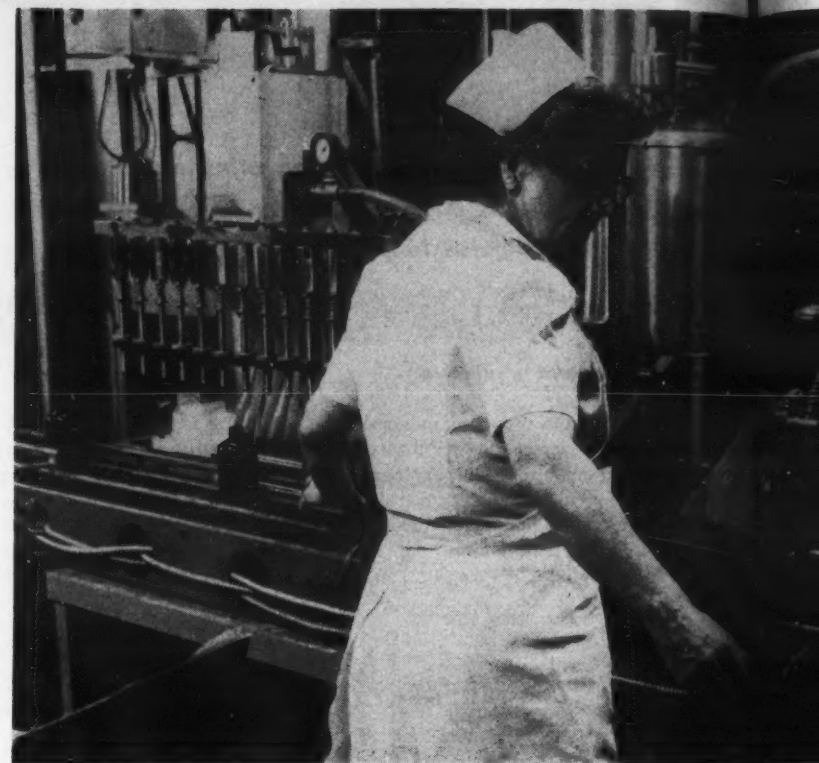
☐ I'd like to know more about the new "55" dispenser.

☐ Please have the Avery man call.

AVERY ADHESIVE LABEL CORP., Custom Div. 123
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117 Liberty Street, New York 6
608 S. Dearborn Street, Chicago 5

name _____
address _____
city _____ state _____
our business is _____

When inquiring check CP 2690 opposite last page



**Replacement of vacuum fillers
by simple constant volume filler...**

drops filling losses fourteen per cent

Problem: In filling bottles with a highly purified grade of trichloroethylene registered under the trade name Trilene®, Ayerst Laboratories Incorporated, of Rouses Point, found vacuum fillers to be unsatisfactory.

Vacuum fillers resulted in excessive overfills and evaporation losses which combined amounted to as much as 15% loss.

Solution: In place of the vacuum fillers, Ayerst Laboratories installed an electronically operated filler. This filler consists of a tank, a float to maintain accurate level, magnetically-operated filling valves and an electronic timer to control the valves. When a bottle is put under the filling spout, timer is automatically "fired" by microswitch and the valve for that spout opens for a definite interval of time. With a constant level and constant time, constant fill is obtained.

Amount of fill is adjustable by the timer setting. There is no need for a complex valve or piston arrangement requiring castings, machining, costly fittings.

Results: Since installing the new filler, product loss during fill has dropped from as much as 15% to 1%. There is a decided drop in vapor content of product in the air. Also, the filler has provided great consistency in the amount of fill.

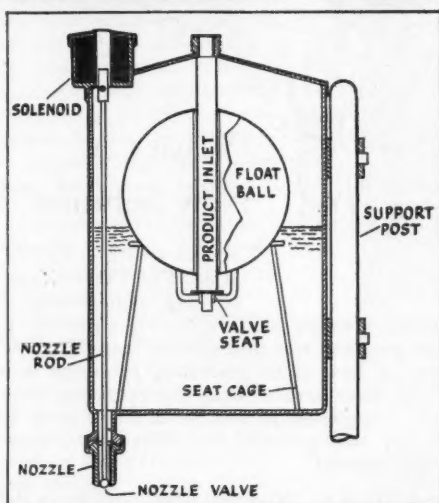
Ayerst was not particularly interested in a high speed filler since Trilene® is a high quality product with many points of check and control. They are, however, interested in filling an exact amount of product in each container. New filler has solved this for them very neatly.

(M-D Electromatic filler is a product of the Mojonner-Dawson Co., Dept. CP, 9151 Fullerton Ave., Franklin Park, Ill. Check CP 2691 opposite last page.)

packaging

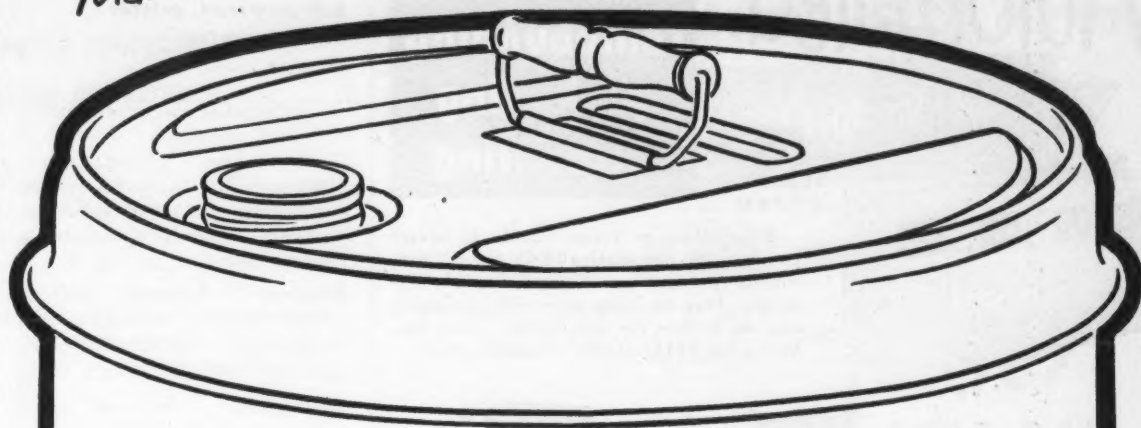
Trilene® filler is shown at center of picture. To operator's right is bottle blower, which is exhausted with small vacuum cleaner. Blower feeds air to bottles through nozzle equipped with solenoid valve, which is actuated through a micro-switch when bottle is placed on conveyor. Filler to left of operator is used for non-volatile liquids

Center operator is placing capped bottles below cap-tightening machine. Operator at left is applying labels while operator at right watches filling operations



Operation of filler is based on fact that at a constant head, liquid will flow through an orifice at a constant rate. Material to be filled is kept at constant level above a nozzle in a tank and opening of nozzle is controlled by electronic timer so that each bottle is filled with uniform volume of product

Make friends with Continental's steel containers



ICC-approved closed head STEEL DRUMS

The fact that Continental closed head steel drums meet Interstate Commerce Commission specifications for shipping inflammable and other dangerous articles is important. Continental packaging, however, offers your products far more than rugged protection. Brightly lithographed with your name or trade mark, each container in your line becomes part of a handsome "package" family. And because customers find these cans so suitable for re-use, your sales story will keep on making good impressions for years. Let us show you how Continental drums can work for you. Call soon.



Why not order "Tripletite" paint cans, "F" style, and conventional cans when you order steel containers. We'll send them along in one freight car to shave your costs on warehouse space, shipping and inventory.

Continental makes a complete line of lug cover, flaring pails, and utility containers. Whatever your product, you'll find sizes and styles to suit your individual needs.



FOREMOST IN QUALITY AND DESIGN

Made from heavy 24- or 26-gauge steel, Continental closed head drums have a capacity of 5 U.S. gallons. Meet ICC specifications 17E and 37D. High-strength body available with straight sides or top and bottom beads. Drum top offset for easy stacking. Construction features include electric lap-weld side seam, and compound-lined, double-seamed head and bottom. Four-finger handle securely welded to top for safe handling.



Also the tops in pouring spouts and closures

CONTINENTAL © CAN COMPANY

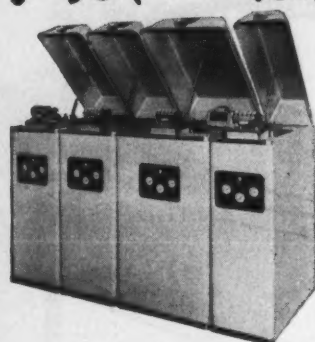
Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4



**TAILOR-MADE
PACKAGE SERVICE**

When inquiring check CP 2692 opposite last page

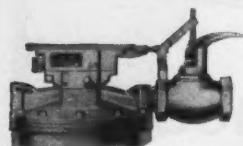
Automated



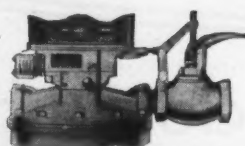
BOWSER
BLENDING
SYSTEM . . .

LIQUID compounding packaging accounting

Blends two or more liquids in preset proportions, automatically, in closed, continuous production. Highest possible accuracy. May be integrated with packaging and accounting for automated production. Write for "BLENDING" folder.



Repeating dial delivers predetermined, repeating quantities automatically.



Predetermining dial delivers quantities up to 10,000 gallons, then shuts off.



Recording printer on meter prints quantity dispensed or received for accounting.

BOWSER
ESTABLISHED 1885

BOWSER, INC., FORT WAYNE, IND.

1315 E. CREIGHTON AVE.

When inquiring check CP 2693 opposite last page

SHADOGRAPH Scales Provide PRECISION Weighing FAST!



SHADOGRAPH's shadow-edge indication is projected by a beam of light, eliminating all friction of indicating mechanism and increasing visible accuracy over 300%. Greater speed in reading is achieved through reduction of lever movement and the action of an adjustable damping device which brings indicating beam to rest quickly. Accurate readings without parallax. SHADOGRAPH MODEL 4106-B (illustrated). Available in a number of models with capacities from 2 grams to 75 lbs.

Exact Weight Scales
Better quality control
Better cost control

THE EXACT WEIGHT SCALE COMPANY

901 W. Fifth Avenue, Columbus 8, Ohio
In Canada: P. O. Box 179, Station 3, Toronto 18, Ont.

When inquiring check CP 2694 opposite last page

PACKAGING

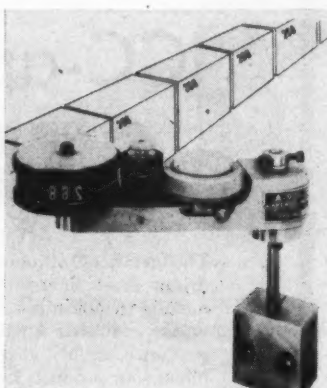
**Self-powered, printer
handles variety
of type . . .**

self-inking device eliminates hand operation

Uses: Prints names, dates, trademarks or other identification on boxes or similar containers at conveyor station.

Features: Automatic unit is friction powered, self-inking, uses rubber type available in all point sizes and fonts.

Description: Built of heavy



Automatic printer is friction powered, self-inking

gage steel. Interchangeable type is instantly removable.

(Unit is product of Kregel Manufacturing Co., Inc., Dept. CP, 227 Fulton St., New York 7, N.Y. . . . check CP 2695 on form opposite last page.)

**Replaces paper labels,
cuts inventories . . .**

printer handles containers from 1/32 to 1 gallon at 1500/hr

Uses: Imprinting variable data such as color, batch number, content, etc. directly on lithographed or preprinted cans or other cylindrical containers.

Features: Unit is adjustable for marking containers ranging in size from 1/32 to 1 gallon. Machine will make up to 1500

(Continued on page 164)



Left—
Union Special
Style 20100 H
Bag Closing
Machine

*Here's how
to close
MULTIWALL
PAPER
BAGS*

FOR lower production costs . . . stronger, neater closures . . . ability to get out rush orders in a hurry, you can't beat Union Special Bag Closing Machines! Specially built to stand up under heavy production schedules, these machines provide the high output rates needed to meet modern competitive conditions.

In the Union Special line, it's easy to find the right unit to meet your particular requirements. **ASK FOR RECOMMENDATIONS.**

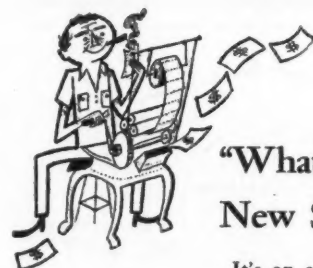
SEND FOR THIS BULLETIN!



Get your copy of this 16 page illustrated bulletin containing helpful data and charts on the complete Union Special line of bag closing machines. **UNION SPECIAL MACHINE CO., 442 North Franklin Street, Chicago 10, Illinois**

UNION SPECIAL

When inquiring check CP 2696 opposite last page



**"What's A
New Solution?"**

It's an article in **CHEMICAL PROCESSING** describing a new way of solving a tough plant operating problem. In each issue you will find specific "case histories" showing how these processing problems were solved. Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

CHEMICAL PROCESSING

STOP WASTE and SPOILAGE

with



POLYLINERS

for CANS

for CARTONS

for DRUMS

CALL OR WRITE FOR FREE
SAMPLES AND PRODUCTION — DELIVERY FACTS

You save packing time and capacity with service-proven C-LINE Polyethylene Liners; of special importance when plant costs and waste must be reduced to stabilize profits. C-LINE Poly Liners are odorless, tasteless, non-contaminating . . . water-proof, non-absorbent and resist most acids and alkalis. Leaking and caking is eliminated—your products reach the customer in a clean, dry state. C-LINE Poly Liners are economical to buy in any size you need—tough and long-lasting to use and re-use.

For immediate action, contact the C-LINE Personal Service Department, describing your products, containers and how shipped. We'll apply our complete facilities and experience (as a pioneer film converter) to provide and deliver on schedule, exactly the right C-LINE Poly Liner for your needs.

PLASTICS DIVISION
CANTON CONTAINERS, INC.
Canton 7, Ohio . . . Phone GL 5-5346

When inquiring check CP 2697
opposite last page

PACKAGING

Speed packaging operation while improving appearance

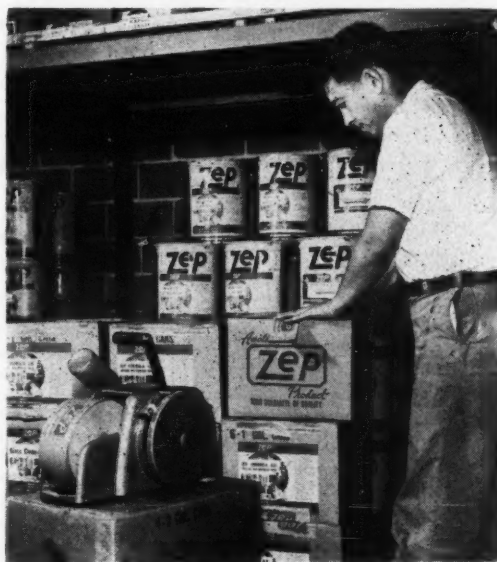
Problem: Zep Manufacturing Corporation of Dallas, Texas, manufactures a line of chemicals and equipment for sanitary maintenance. At present this line includes over 500 different items. Since a large portion of this output is distributed by mail order, this manufacturer has always been very conscious of the appearance of their packages. In manufacturing this great quantity of products, even a small hitch in packaging can be a real cumulative headache.

In sealing cartons containing cans of liquid cleaners and liquid waxes such a problem arose. Zep was using a "pull and tear" type of tape dispensing machine. This machine was giving packages rough corners, estimated length of tape was not always accurate, and machines themselves were hard to handle if operator did not hold them down during taping operation. On several occasions machines tipped over when operator tried to pull tape.

Solution: Zep installed a coded-type dispenser which automatically measures, dispenses, moistens, and cuts the tape. This allows operators to get accurate lengths of tape with square ends.

Results: Using this dispenser Zep has been able to improve the appearance of its cartons while speeding packaging operations. Operation is much

(Continued on page 165)



Portable tape dispenser prevents unattractive sealing of packages due to rough corners. Operator simply pulls lever, turns it loose, and has desired length of tape ready for sticking. Tipping of dispenser, experienced with pull and tear type machines, is completely eliminated with this unit

SLY PIONEERS and LEADERS in INDUSTRIAL DUST CONTROL for all process operations

CRUSHING



MILLING



GRINDING



SCREENING



BLENDING



MIXING



DRYING



SEPARATION



FEEDING



CONVEYING



ELEVATING



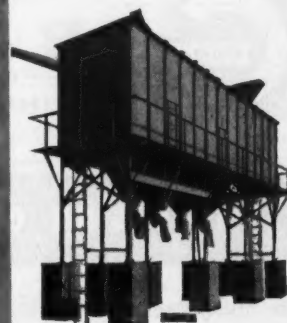
WEIGHING



PACKAGING



SLY FLAT BAG DUST FILTERS



GET ALL OF
THE DUST
FROM THESE
OPERATIONS



SEND FOR BULLETIN 98

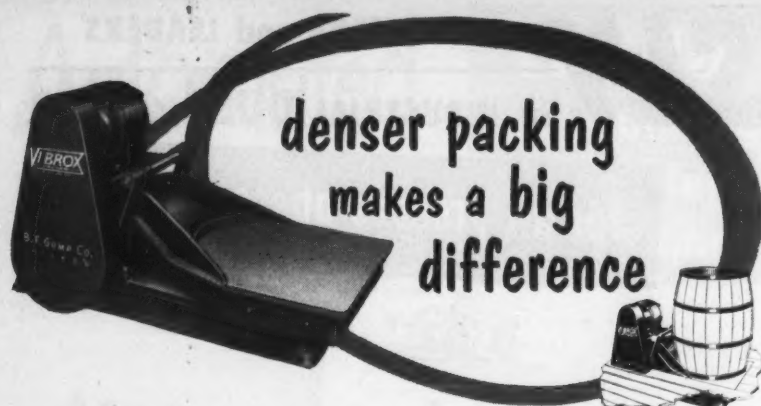
THE W. W. SLY SINCE 1876 MANUFACTURING CO.

Visit Our Booth
at the
CHEMICAL SHOW
Philadelphia, Dec. 5

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OFFICES IN
PRINCIPAL CITIES

When inquiring check CP 2698 opposite last page



The VIBROX Barrel and Drum Packer with the exclusive mechanical rocking-vibrating motion packs more material in the drum or barrel or permits the use of smaller containers; cuts packing time; and reduces packing labor as much as one-third. Yes, in packing most dry powdered, flake, or granular materials, the VIBROX Packer makes a big differ-

ence in the over-all packing costs—big enough, many users say, to pay for the VIBROX in a few months.

Several sizes are available for packing boxes, cans, cartons, kegs, drums, and barrels having capacities of from 5 to 1000 pounds. Other models are used for packing bags weighing up to 150 pounds.

Complete information and recommendations on request. Write today.



FEEDING • MIXING • SIFTING • GRINDING • WEIGHING • PACKING
and PACKAGING EQUIPMENT FOR THE PROCESS INDUSTRIES

B. F. GUMP Co.

Engineers and Manufacturers since 1872

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When inquiring check CP 2699 opposite last page

Processing equipment you need

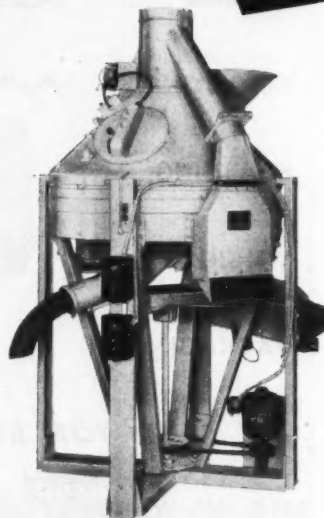
for crushing, grinding, granulating, pulverizing,
texturizing, fiberizing, separating, classifying

Many of your processing problems can be readily solved by looking over our literature on the extensive line of Bauer equipment. If you get up to the point where you want specific information, we'll be glad to give you the benefit of our long experience in the processing field.

What's more, we have two research laboratories in which we can make tests and short production runs if we don't already know the answers to your problems.

Our line consists of breakers, crushers, attrition mills, laboratory mills, granulators, texturizers, fiberizers, cleaners, separators, exhausters—all briefly described in Bulletin No. 52.

Ask for the bulletin. No representative will call unless invited.



Bauer Specific Gravity Separator which cleans or classifies many products and materials by a combination of mechanical and pneumatic force

THE BAUER BROS. CO.

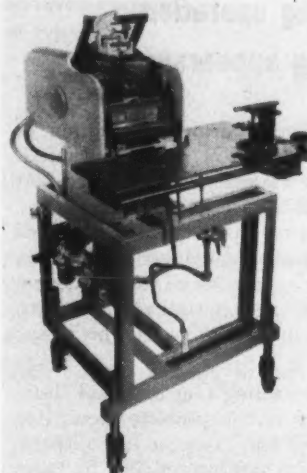
1728 Sheridan Ave. • Springfield, Ohio

Established 1878

When inquiring check CP 2700 opposite last page

PACKAGING

(Continued from page 162)



Printer has capacity of 1500 cans per hour

imprints per hour. Maximum imprint area is 2 x 6".

Description: Containers are printed as a sliding carriage, which holds the can, is moved from right to left. After imprinting, can is ejected onto conveyor or removed manually.

(Printer is product of Markem Machine Co., Dept. CP, Keene 52, New Hampshire . . . or for more information check 2701 on form opposite last page.)

Aerosols unlimited — theme of booklet

Twelve page booklet, printed in three colors, gives background and explains aerosol packaging industry. It points out that last year annual dollar volume reached one-quarter billion.

While not heavily technical, text explains what an aerosol is, how aerosol products are packaged, and mechanism of the container and its operation. Typical aerosol production process is pictured.

"Aerosols Unlimited" is issued by Sprayon Products, Inc., Dept. CP, 2075 E. 65th St., Cleveland 3, Ohio. When inquiring specify CP 2702 on form opposite last page.

if your
product

tends to
dry out

WALLPAPER
CLEANER

picks up
moisture

is perishable

BISCUITS

is greasy

THERE'S AN **RC** FIBER CAN TO
REDUCE YOUR COST

(foil-lined, pitch-backed, paraffin-coated,
laminated kleerwrap, many others).
WRITE today for further information.

R-C CAN COMPANY

ST. LOUIS 14, MO.

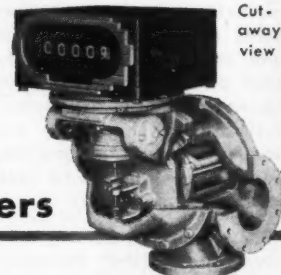
When inquiring check CP 2703 opposite last page

Account For Corrosive Liquids

ALCOHOLS, VEGETABLE OILS,
DEIONIZED WATER, ETC.,

with

**Rockwell
"316"
Stainless
Steel Meters**



Cut-
away
view

Be Sure of Your End Product

Want the finest degree of quality control in your formulations? Need accurate cost controls over liquid ingredients? Is inventory a problem? Are losses eating into your profits? Then turn to a basic accounting tool—Rockwell liquid meters. Get the accurate metered records you need to operate efficiently. Available in a wide variety of types, materials and sizes to suit every requirement. Our bulletins tell all. Write today.

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DEPT. 106-M, PITTSBURGH 8, PA.

When inquiring check CP 2704 opposite last page

CHEMICAL PROCESSING

**FASTER,
EASIER,
MORE
EFFICIENT
CLEANING...**

for **2½ cents**
per gallon

Whether the job calls for cleaning heavy duty tanks of metal, plastic and glass lined, or cleaning general equipment, Alconox combines power with the gentleness that spells **SAFELY CLEAN.**

Compounded from numerous different chemicals Alconox is blended into a fast acting multiple cleaning detergent that meets your cleaning needs every time—and at 2½ cents per gallon.

Used by leading industrial firms who found it better for such varied uses as cleaning ball bearing assemblies, optical lenses and industrial glass piping systems, after recommendations by their own research departments.

ALCONOX outsells
because
it outperforms

Literature,
Samples and
the name of
your nearest
distributor
upon request.

For specific problems
write or call
our Technical Department

AVAILABLE IN
BOX of 3 lb. \$ 1.95
CARTON of 12 boxes of 3 lbs. .. 18.00
DRUM of 25 lbs. lb. .45
DRUM of 50 lbs. lb. .40
DRUM of 100 lbs. lb. .40
DRUM of 300 lbs. lb. .37
(Slightly higher on Pacific Coast)
**ALCONOX, INC., 61-63 Cornillon Ave.,
Jersey City 4, N. J.**

When inquiring check CP 2705
opposite last page

PACKAGING

(Continued from page 163)

faster since operator simply pulls lever and releases it for the desired length of tape moistened, ready for application. Also it has been found that much less waste results from correct measuring and moistening of the tape.

Since the machine is easily portable it is used in all parts of the warehouse to seal cartons which have been filled and to reseal cartons which have been opened for some reason.

(Dispenser is a product of Better Packages, Inc., Dept. CP, Shelton, Conn. . . or for more information check CP 2706 on form opposite last page.)

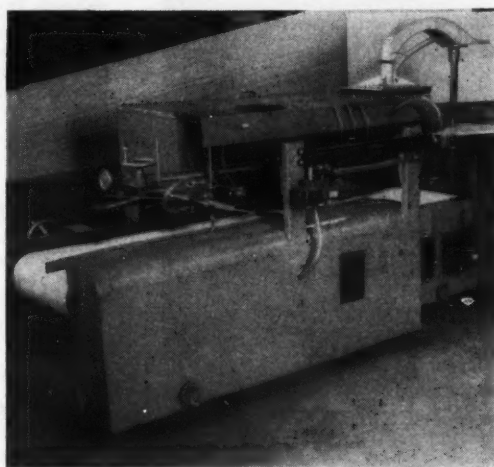
**Opens, empties, ejects cartons
without manual operation . . .**

vacuum arm removes bottles or jars from carton, rejects broken containers

Uses: Automatically unloads up to 12 cartons per min of glass containers in most shapes, sizes.

Features: Broken or cracked containers are rejected by vacuum lifting arm, left to be ejected with empty carton.

Description: Self-contained unit lifts carton flaps, removes containers with vacuum arm, deposits them on unscrambling table. Unloads five to 12 standard cartons per minute, depending on



Vacuum lifting arm rejects cracked or broken bottles

requirements of unscrambling and filling operations. Changeover from one carton size to another in five minutes. Unloader weighs 1500 lb, occupies floor space 6 x 9'.

(Style-O-Vac unloader is product of Island Equipment Corp., Dept. CP, 27-01 Bridge Plaza North, Long Island City 1, N.Y. . . or for more information check CP 2707 on form opposite last page.)

New **AUGER-MATIC** Valve Bag Packer

**SHAKES . . . SETTLES . . . AS IT WEIGHS AND FILLS
CUTS YOUR BAG SIZE AND COST**

AUGER-MATIC fills, shakes and weighs paper valve bags all in one operation. Just push the starter button and when desired weight is reached it shuts off automatically. Cuts cost of bags and packing costs on powdered, granular, pellet and fibrous materials . . . reduces dust to a minimum.



NEW!

Fill Valve Bags as Small as 10 Pounds

**Your Present Auger-MATIC is now
more versatile than ever**

New small sizes spouts and augers now available to fit production requirements on 10 to 25 pound bags. You can change in a matter of minutes from packing 100 pound bags to the 10 pound valve bags . . . cut cost by using minimum size bags for exact weight desired.

For further
information...
call or write

E. D. CODDINGTON MFG. CO.

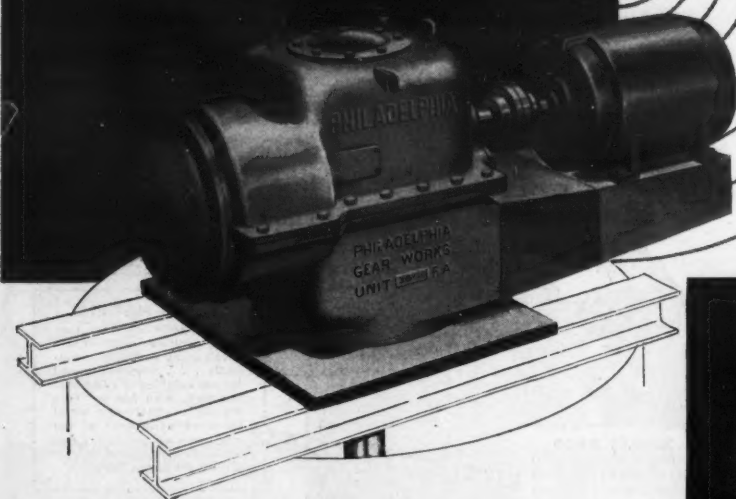
5036 N. 37th STREET • MILWAUKEE 9, WISCONSIN

When inquiring check CP 2708 opposite last page

new

a complete line of

packaged FLUID AGITATORS!



Philadelphia Gear Works is proud to offer a new line of packaged fluid agitators... plus complete fluid agitation engineering service... plus field service—right in your plant—covering every phase of your particular fluid agitation applications. Our engineers are prepared to specify agitation to best meet your process requirements. As you know, Phillie Gear reducers for agitator drives have been meeting the most exacting standards of major processors for many years. We have the answers to your agitation problems. Let us assume the responsibility for every phase of your fluid agitator installations.

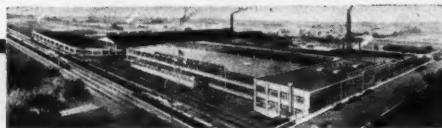
See our new agitator drive in action at the **CHEM SHOW Dec. 5-9, Philadelphia Convention Hall, BOOTH 33.**

SEND FOR ILLUSTRATED BULLETIN DESCRIBING NEW PACKAGED AGITATOR DRIVES.



PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. & G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.
BALTIMORE • CLEVELAND
Virginia Gear & Machine Corp. • Lynchburg, Va.



Industrial Gears & Speed Reducers

LimitTorque Valve Controls
Established 1892

When inquiring check CP 2709 opposite last page

CHEM SHOW ADDENDA

Here are additional exhibits planned for the 25th Exposition of Chemical Industries. Information was received too late for the 23-page listing which appeared in last month's **CHEMICAL PROCESSING.**



BAKER PERKINS INC. Saginaw, Michigan

Chemical Machinery Division will exhibit mixing and kneading machinery, centrifugals, and other chemical process machinery.

ECLIPSE FUEL ENGINEERING COMPANY Rockford, Illinois

Will show direct-fired process heating equipment—including burners, fuel mixers, and controls.

FENWAL INCORPORATED Ashland, Massachusetts

Thermistor-actuated temperature controller will feature adjustable bandwidth, proportioning control, and on-off control with indication. Wire lead length to sensing element is not critical.

GLENGARRY

Bay Shore, New York

Weighing and proportioning equipment for wet and dry use. Dry weighing units cover these ranges: one to fifty grams, two ounces to five pounds, and five to fifty pounds. Reciprocating pump will discharge one to five cc per shot.

HEIL PROCESS EQUIPMENT CORPORATION Cleveland, Ohio

Will show solid plastic fan for use with strong acid or alkali fumes. Portable acid storage tanks, plastic ventilation equipment, and impervious-graphite heat exchangers will also be included.

LINK-BELT COMPANY Chicago 1, Illinois

Rotary dryer, Bulk-Flo and oscillating conveyors will be shown. Another important development will be a liquid vibrating screen. Standard line of components and chain will also be on display.

RODNEY HUNT MACHINE CO.

Orange, Massachusetts

Continuous evaporation and spray drying equipment. Exhibit will feature Turba-Film evaporator designed for processing heat-sensitive and heavy viscous materials.

L.O. KOVEN & BROTHER, INC.

Jersey City, New Jersey

Photographs of equipment used in X-ray testing of pressure vessels will be exhibited, in addition to other equipment for the chemical processing industries.

LUKENS STEEL COMPANY

Coatsville, Pennsylvania

Samples, fabrication procedures, welding techniques, and model cutaway vessel of clad steel will be shown.

MARCO COMPANY, INC.

Saginaw, Michigan

Exhibit will feature continuous reactors and various models of Flow-Master pumps.

MINNEAPOLIS-HONEYWELL REGULATOR CO.

Philadelphia 44, Pennsylvania

Industrial Division will exhibit a very fast (1/4-second) stripchart recorder. Features null-balance and 11-inch wide chart. Blind pneumatic transmitter offers complete rangeability without adding or changing parts. Improved miniature pneumatic instruments, data handling systems, and diaphragm control valves are also included.

OWENS-CORNING FIBERGLAS CORPORATION

Toledo, Ohio

Will exhibit Kaylo "20", a high-temperature insulation. It will handle temperatures from 0°F up to 1800°F. Fiberglass insulation, reinforced plastic tanks and pipes will also be shown.

THE PATTERSON FOUNDRY AND MACHINE COMPANY

East Liverpool, Ohio

Will exhibit dispersion mill, pebble and ball mills, and conical vacuum dryer.

PETRO-CHEM DEVELOPMENT CO. INC.

New York 17, New York

Will exhibit direct-fired furnaces.

TAYLOR INSTRUMENT COMPANIES

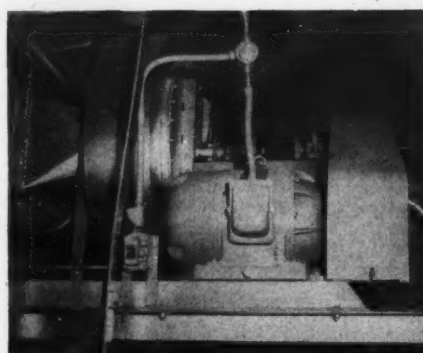
Rochester, New York

Scanning and logging control systems will be shown. Exhibit also includes a potentiometric transmitter.

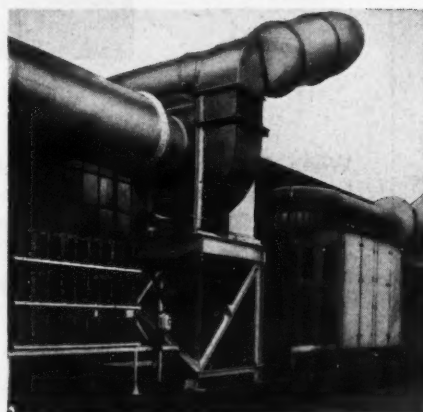
**A "DOWN" REPORT
LIKE THIS
IS A PLEASURE!**

PROCESS COST REPORT
SUBJECT: FANS

ITEM	Change	
	Up	Down
Overhaul and Repairs	—	X
Power Usage	—	X
Shut-down Losses	—	X
Depreciation Charges	—	X
Spoilage, Leakage	—	X
Complaints	—	X
Absenteeism	—	X
Insurance Rates	—	X
Fire, Explosion Hazards	—	X



Pressure Blower Handles 240° F.
Air for Drying Aureomycin Cake.
Gas-tight, Sparkproof Construction.



Stainless Steel Fan Handles 17,000
CFM of Corrosive Exhaust Gases
at 1000° F.

...To All Engineers Concerned with Reducing MAINTENANCE COSTS

Efficient air handling systems are vital in chemical and industrial plants for processing, by-product recovery, conveying, waste disposal, combustion, and many other essential functions. Corrosion, here, can take a heavy toll in excessive operating and maintenance costs.

Losses from corrosive destruction can be greatly reduced by installing fan equipment specially designed for efficient handling and effective protection under the specific conditions involved.

FOR MAXIMUM RETURN on your FAN investment, install the fan best suited to your needs. Design, construction, selection and application of fans for corrosive service demand highly specialized engineering and manufacturing skills. You get all these from BAYLEY — plus a complete line of fans in types, sizes, and protective treatments for virtually any duct or piping system.

Refer your application problems to BAYLEY

Bayley

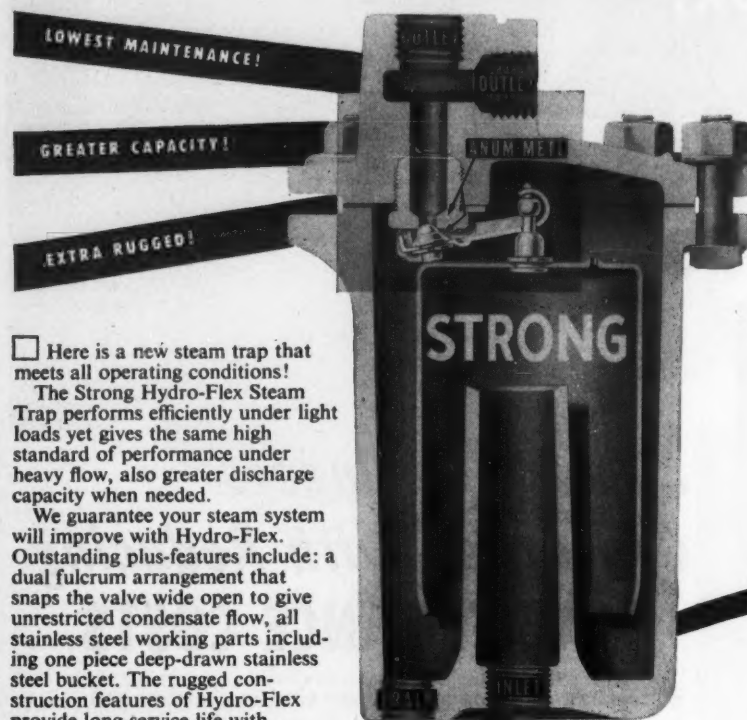
BLOWER COMPANY

1823 South 66th St.

• Milwaukee 14, Wisconsin

When inquiring check CP 2710 opposite last page

NEW WAY TO REDUCE STEAM COSTS AND INCREASE PRODUCTION



Here is a new steam trap that meets all operating conditions!

The Strong Hydro-Flex Steam Trap performs efficiently under light loads yet gives the same high standard of performance under heavy flow, also greater discharge capacity when needed.

We guarantee your steam system will improve with Hydro-Flex.

Outstanding plus-features include: a dual fulcrum arrangement that snaps the valve wide open to give unrestricted condensate flow, all stainless steel working parts including one piece deep-drawn stainless steel bucket. The rugged construction features of Hydro-Flex provide long service life with minimum maintenance.

Your local Strong distributor will give you complete information or write us for Bulletin No. SS-40.

STRONG, CARLISLE & HAMMOND COMPANY
1302 W. 3RD. STREET • CLEVELAND 13, OHIO



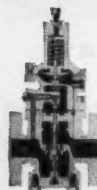
HORIZONTAL TYPE SERIES

Hydro-Flex traps with horizontal inlet have the same features as bottom inlet types.

STRONG
HYDRO-FLEX
STEAM TRAPS

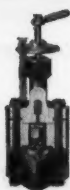
high efficiency under all condensate loads

Available from over 200 industrial distributors in the United States, Canada and Foreign Countries.



PRESSURE REGULATING VALVES

3 types available for wide range application . . . to meet pressure and capacity requirements.



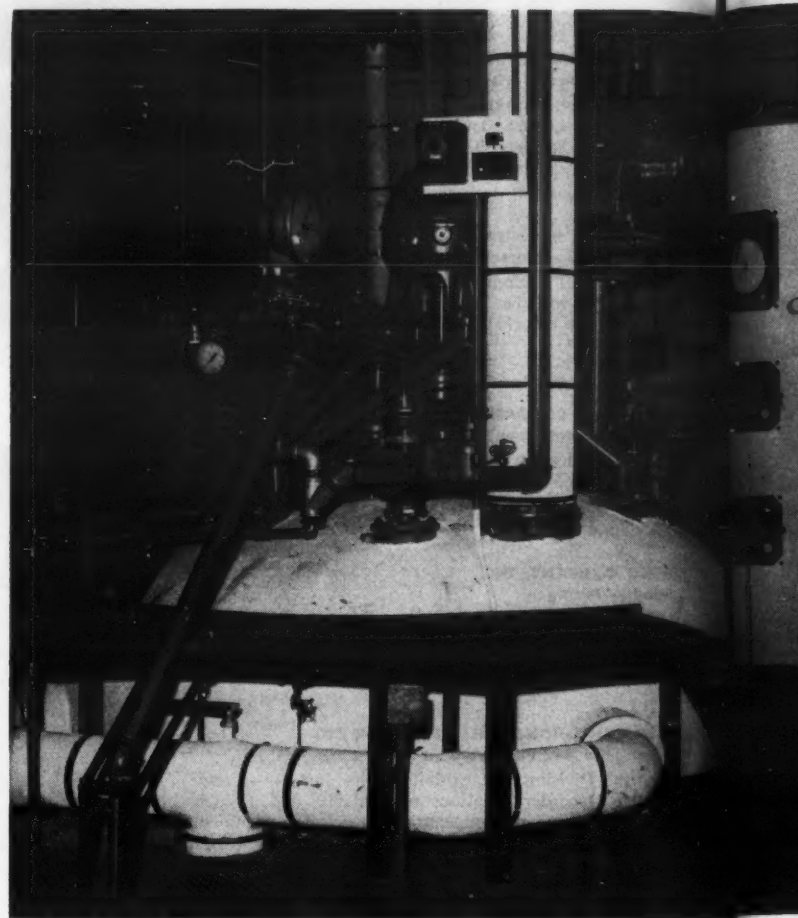
BLOW-DOWN VALVES

are customized for job demands. Bolted body permits non-threaded seats and wide selection of seat sizes.



STRONG STRAINERS
Offer maximum protection from dirt, scale or sediment. Available in semi steel, cast steel and bronze.

engineering and
maintenance



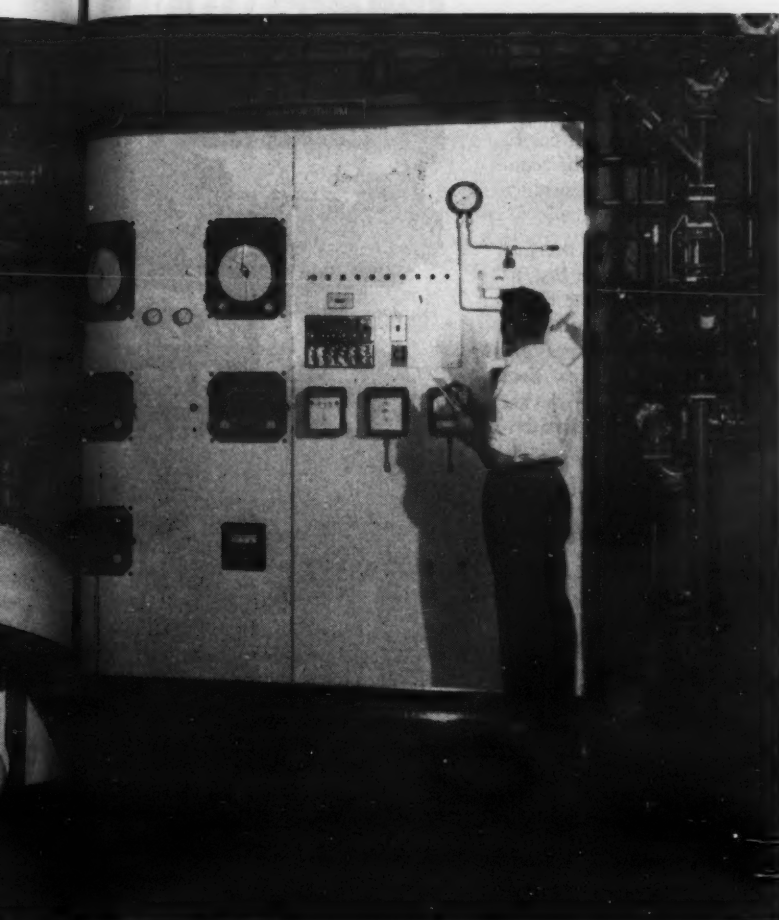
When chlorinated diphenyl stable heat transfer oil is used in forced recirculation heating system at Argus Chemical Corporation —

temperature control is $\pm 1^\circ\text{F}$

Close temperature control in system operating up to 550°F combined with use of glass-lined vessel assures high quality product

At Argus Chemical Corporation, Brooklyn, N. Y., temperature control of $\pm 1^\circ\text{F}$ in a system operating up to 550°F is obtained through the use of a forced recirculation heating setup, in which a stable, fire-resistant heat transfer oil, Aroclor 1248 (a chlorinated diphenyl) is used. This system, placed in operation in October 1954, heats a 3500-gal glass-lined vessel used in the manufacture of heat and light stabilizers for polyvinyl chloride. Close temperature control and

When inquiring check CP 2711 opposite last page



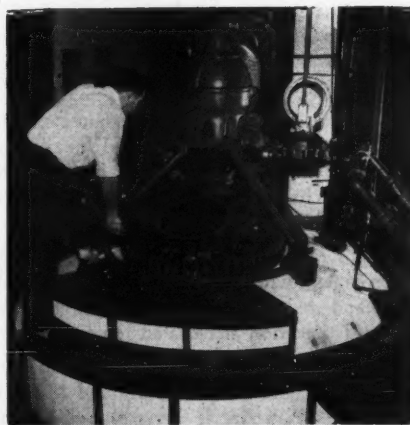
Processing vessel and heating system
at Argus Chemical

the elimination of contamination by use of the glass lining assure a high quality product.

During heating and cooling periods, ranging from 75° to the 550°F maximum, temperature differential between the contents of the kettle and the heat transfer fluid does not exceed 175°F. This is necessary in order to prevent damage to the glass lining.

In a recent test, the overall heat transfer coefficient from the Aroclor through the glass-lined shell to the batch, which is an organic material of fatty origin, was determined. Due to the nature of the control setup, this coefficient could only be measured accurately at comparatively low temperatures, with the heat transfer

(Continued on next page)



Glass-lining prevents any possibility of
contamination from walls of kettle

two famous names join forces...



BELMONT

for greater service to Industry

• The consolidation of product lines and sales service facilities of the United States Gasket Company and The Belmont Packing & Rubber Company creates a new major source for all your gasket, packing and allied product requirements—plus the most complete line of TEFLON and KEL-F stock offered to Industry, today.

It brings together the specialized engineering and manufacturing experience, and enlarged, modern production facilities of these two companies to better serve your standard and special needs.

It brings together the nationwide Industrial Distributor organizations of both companies—backed by an enlarged staff of U. S. Gasket-Belmont Packing field representatives—to make these combined lines even more readily available and profitably employed in every industrial community.

UNITED STATES GASKET COMPANY, Camden 1, N. J.

THE BELMONT PACKING & RUBBER COMPANY, Phila. 37, Pa.

U. S. GASKET—BELMONT PACKING PRODUCTS INCLUDE:

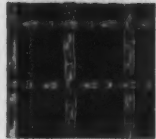
PACKINGS: MOLDED RINGS—Teflon, Asbestos Cloth, Duck, SPIRAL OR COIL PACKING—Braided and Twisted Asbestos, Braided Teflon, Extruded Teflon, Asbestos Fabric, Duck and Rubber, Flax and Jute, Metallic and Semi-Metallic. **PLASTIC PACKING**—Teflon, Shredded Asbestos, Metallic. **SHEET PACKING**—Asbestos, Fibre, Cork, Rubber, Synthetic Rubbers, Metallic. **O-RINGS, BACK-UP RINGS, V-RINGS, CUPS, U-RINGS, FLANGE PACKINGS**—Teflon, Leather, Rubber, Rubber-Reinforced. **GASKETS**: Spiralwound, Molded Teflon, Kel-F, Teflon-Jacketed, Metal-Asbestos, Asbestos, All Metal. **TEFLON SPECIALTIES**: Expansion Joints, Flexible Couplings, Adaptors, Reducers, Rotating Mechanical Seals. **TEFLON & KEL-F STOCKS**: sheets, tape, rods, tubing, bars, cylinders, fabricated parts.

U. S. GASKET • BELMONT PACKING

When inquiring check CP 2712 opposite last page



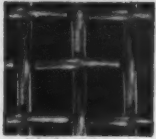
Flat Wire Mesh



Double Intermediate Crimp



Single Intermediate Crimp



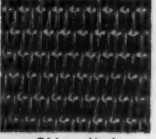
Double Crimped



Twilled Weave



Calendered Backing



Oblong Mesh

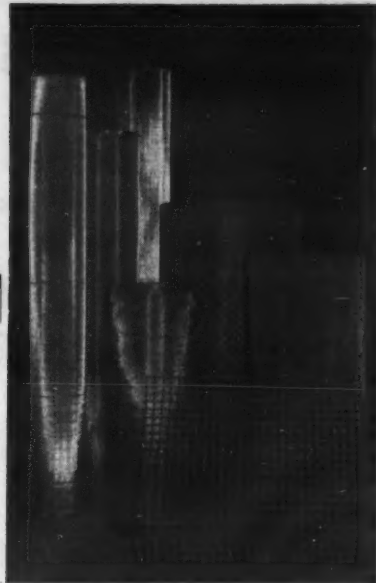


Plain Dutch Filter



Twilled Dutch Filter

need
**WIRE
CLOTH**
in
a
hurry?



call *Cambridge*
for shipments
FROM STOCK

COMPLETE LINE—Cambridge stocks include a wide variety of specifications from the finest to the coarsest mesh in any metal or alloy.

QUALITY—Accurate mesh count and uniform mesh size are assured by individual loom operation and careful inspection just before shipment.

PROMPT SERVICE—You get immediate delivery on large or small orders for the most frequently used types of cloth. If your needs are not in stock, we'll schedule our looms to get your material to you without delay.

CAMBRIDGE ENGINEERS, in the home office and in the field, are fully qualified to help you select weaves, mesh sizes and metals to meet your needs.

IF YOU NEED SPECIAL WIRE CLOTH FABRICATIONS—Strainers, screens, filter leaves, etc. . . . we can build them quickly and accurately from your prints. . . . or, our engineers will draw up prints for your OK.

LET US QUOTE on your next order for wire cloth in bulk or fabricated wire cloth parts. Call your Cambridge Field Engineer—he's listed under "Wire Cloth" in your classified telephone book.

OR, WRITE DIRECT for FREE 80-page CATALOG and stock list giving full range of wire cloth available. Describes fabrication facilities and gives useful metallurgical data.



The Cambridge Wire Cloth Co.



Department F,
Cambridge 12,
Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 2713 opposite last page

ENGINEERING & MAINTENANCE

TEMPERATURE CONTROL

(Continued from preceding page)

oil at about 275°F and the batch at about 125°F. Overall heat transfer coefficient at these unfavorable conditions was found to be in the neighborhood of 30 Btu/hr/sq ft/°F. Inside film coefficient of the fatty organic material is the controlling resistance at this temperature. Resistance of the heat transfer oil film is relatively low.

Heat source is an International-LaMont thermal forced recirculation heater of three million Btu/hr capacity. Designed to handle heat transfer fluids at elevated temperatures, heater is fired by a dual type burner for either natural gas or fuel oil. Water-cooled centrifugal pump circulates heat transfer oil through agitator nozzles in jacket of reactor. This provides uniform heat distribution without danger of overheating.

(Aroclor heat transfer oil is product of Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. . . . or for more information check CP 2714 opposite last page.)

(High temperature heating system was engineered by American Hydrotherm Corp., Dept. CP, 33-70 12th St., Long Island City 6, N. Y. . . . or for more information check CP 2714A opposite last page.)

(Glass-lined vessel is product of The Pfaudler Co., Dept. CP, 1000 West Ave., Rochester 3, N. Y. . . . or for more information check CP 2714B on form opposite last page.)

Fungus and heat requirements of government specs met by vinyl tubing . . .

have high dielectric strength, heat aging, and fungus resistance

Uses: Tubing is used extensively by electrical equipment and electronic manufacturers to meet Underwriters' Laboratories requirements and government spec MIL-I-631B.

Features: Tubing passes all requirements for high dielectric strength, heat aging, and fungus resistance. It is self-extinguishing, and has improved heat deformation characteristics and greater resistance to "cut-through".

Description: Improved Temflex 105 vinyl plastic tubing provides additional enhanced color stability and reduced shrinkage under conditions of sustained operation at elevated temperatures.

(Improved vinyl plastic tubing is a product of Irvington Div., Minnesota Mining and Manufacturing Co., Dept. CP, 6 Argyle Terrace, Irvington 11, N.J. . . . or for more information check CP 2715 on form opposite last page.)

for **PUMPING
CHEMICAL
SOLUTIONS!**

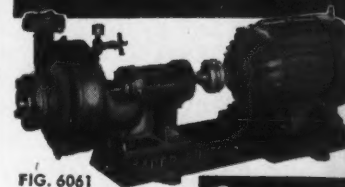


FIG. 6061

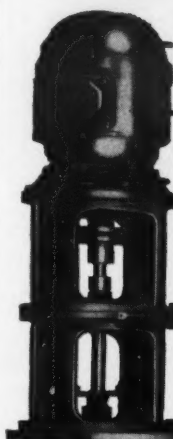


Fig. 19,488

Write for
**TABER
BULLETINS
C-355
for
HORIZONTAL
PUMPS
...
for
VERTICAL
PUMPS
V-837**

TABER PUMPS ARE
specially built for
handling chemical solu-
tions, efficiently and
economically . . . in the
processing industries.
The Vertical design
permits locating stuff-
ing box above and
out of liquid level.
Therefore nothing
to leak.

BULLETINS
as above gladly
sent on request.

TABER PUMP CO.
Est. 1859
320 ELM ST.,
BUFFALO 3, N. Y.

N-776

TABER

When inquiring check CP 2716
opposite last page

CHEMICAL PROCESSING

**Splash-proof, dust-tight
air cylinder control
valves . . .**

removal of cover renders valve electrically inoperative

Uses: Air cylinder control.

Features: Solenoid covers of air cylinder control valve are zinc alloy and gasketed to be splash-proof and dust-tight. Control valves are electrically inoperative when solenoid cover is removed.

Description: At end of cover is a button which can be worked with a small screwdriver to provide manual operation of valve without removing cover. Cover is chained to valve and held in place by four captive screws. Valves are available in all standard sizes from $\frac{3}{8}$ to $1\frac{1}{4}$ " IPS, in series "B" (3-way) and series "BB" (4-way).



Cover is chained to valve and held in place by four captive screws

(Air cylinder control valves are a product of Hannifin Corp., Dept. CP, 568 South Wolf

Rd., Des Plaines, Ill. . . . or for more information check CP 2717 on form opposite last page.)

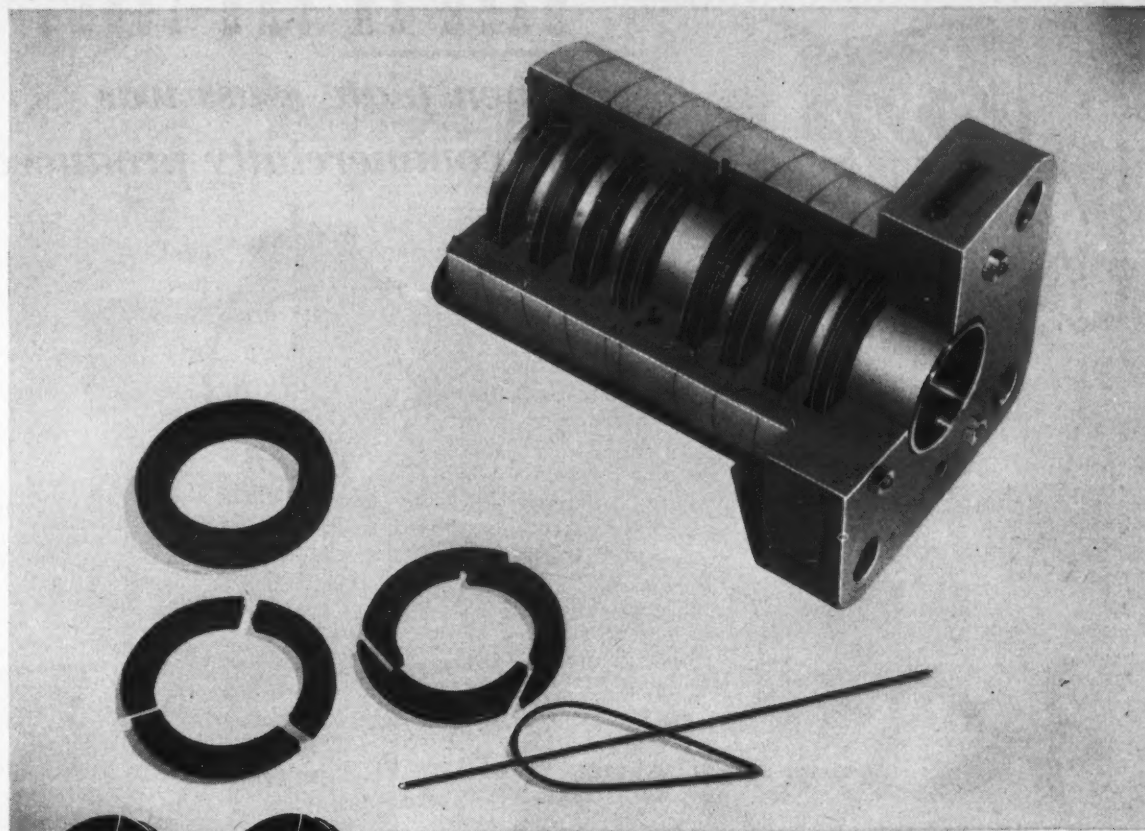
**Exterior wear reduced,
longer service life
given hose . . .**

vinyl wearstrip increases use in applications formerly considered too severe

Uses: Ducting for spot air conditioning, ventilating, dust collection, fume control, and material handling.

Features: A vinyl plastic wearstrip bonded over spiral wire reinforcement on lightweight flexible hose and ducting greatly reduces exterior wear from contact with rough and abrasive surfaces.

Description: Wear-resistant feature assures longer service life and affords possibilities for use in applications formerly considered too severe for lightweight hoses. Wearstrip is available for flexible hoses in 4 to 12" ID and retractable ducts in sizes 3 to 36" ID. (Flexaust hoses and Portovent retractable ducts are products of Flexaust Co., Dept. CP, 100 Park Ave., New York 17, N. Y. . . . or for more information check CP 2718 on form opposite last page.)



Look to COOK

for Better Non-Lubricated CARBON PACKING

COOK carbon packing rings are made of a special carbon graphite material that automatically assures you *high resistance to wear, chemical inertness and excellent heat conductivity.*

COOK Rings in any case make for a better seal — but when placed in a Cook case assure

you the perfectly engineered carbon packing. If you have sealing requirements for non-lubricated compressors, write today for a sample carbon ring, plus literature on Cook's complete line of packing materials. Address C. Lee Cook Company, 916 South Eighth Street, Louisville 3, Ky.

**C. LEE
COOK
COMPANY**

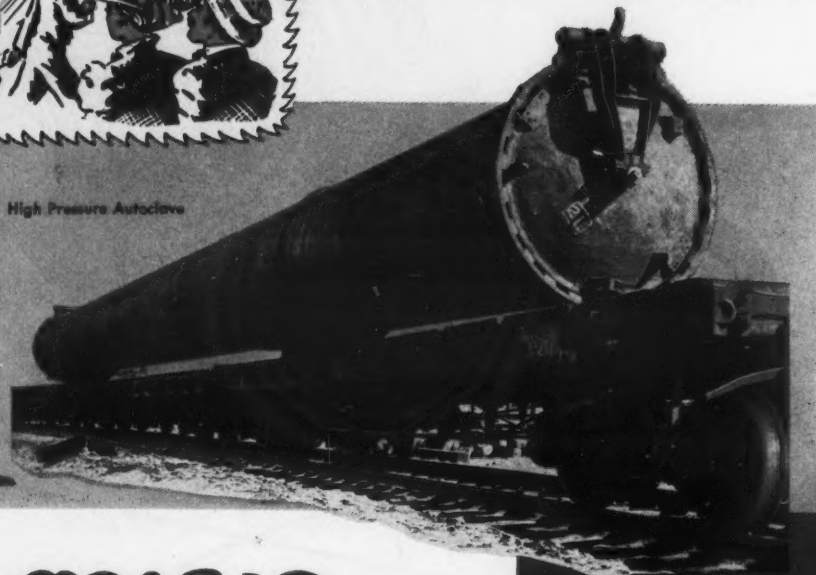
Sealing Pressures Since 1888

When inquiring check CP 2719 opposite last page



High Pressure Autoclave

BACK IN THE 1880's
when plate glass was
first commercially produced



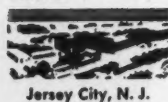
Koven

**WAS MAKING INDIVIDUALIZED
CHEMICAL EQUIPMENT**

To flourish, American industry has always depended upon a careful selection of the best facilities. That's why, as far back as the early 1880's, chemical manufacturers insisted upon the use of KOVEN-built equipment—to ensure the most efficient means to fast, economical production.

Designed and built to fit specific needs, KOVEN Individualized Equipment has, for almost 75 years, contributed to the ever-increasing growth of the chemical industry. Why not let this invaluable experience work for you, too. There's no obligation—so call or write now for a consultation with a trained KOVEN representative. Send for Bulletin #550.

Plants:



Jersey City, N. J.



Dover, N. J.



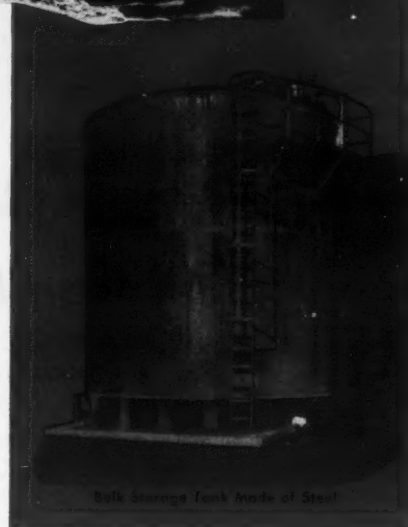
Trenton, N. J.

Specialists in intricate fabrication using:

- stainless steel • aluminum
- monel • inconel
- nickel • all clad materials

Fabrication to all A.S.M.E. Codes

**KOVEN FOR INDIVIDUALIZED
EQUIPMENT SINCE 1881.**



Bulk Storage Tank Made of Steel

X-RAY INSPECTION FOR QUALITY CONTROL.

KOVEN equipment in all metals and alloys includes: High pressure vessels, extractors, mixers, stills, kettles, tanks, stacks, breechings. Shop and field erected storage tanks to 2 million gallons, high vacuum testing.

L. O.

Koven & BRO., INC.
154-A Ogden Ave., Jersey City 7, N. J.

When inquiring check CP 2720 opposite last page

ENGINEERING & MAINTENANCE

**Drawn light-wall tubing
now supplied in sizes
up to 2-1/16" OD . . .**

drawn in variety of stainless steels in lengths up to 28 feet

Uses: Present applications of tubing include bel-lows, low pressure heat exchanger tubes, flexible hose, electron power tube anodes and cathodes, fractional hp motor casings, casings for radioactive well logging instruments.

Features: Tubing is supplied in sizes up to 2-1/16 OD, in lengths up to 28 feet max.

Description: Light-wall stainless tubing comes in AISI Types 304, 321, 347, and in Monel metal. Minimum OD is 7/8". Various wall thicknesses are available.

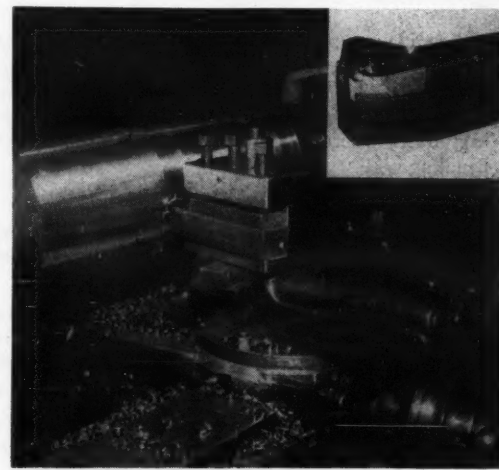
(Weldrawn tubing is product of Superior Tube Company, Dept. CP, 1512 Germantown Ave., Norristown, Pa. . . or for more information check CP 2721 on form opposite last page.)

**Metal-cutting tool bits
made of alumina
cut faster . . .**

in addition to being less costly, tests show they need no coolant, give excellent surface finish

Uses: As a cutting tool bit for use on many metals.

Features: Ceramic cutting tools are less expensive than conventional tools. Machining tests from steel, commercial brass, and low-alloy cast iron show that the hardness, high-temp strength, and wear-resistance properties of cutting tools are superior to metallic



Work piece and ceramic cutting tool remain cool to touch without coolant when operated with proper tool geometry and chip breaker adjustment

tool compositions. Tool bits can be operated at higher speeds: up to three times faster than normal. They require no cooling and produce excellent surface finish. The finish is attributed to absence of top face cratering by chip friction due to low affinity of ceramic for metals.

Description: Cutting tools are made of aluminum oxide and are available in experimental quantities.

They are held by means of heavy, rigid tool holders to overcome characteristics of lower tensile strength at room temp and less thermal shock resistance.

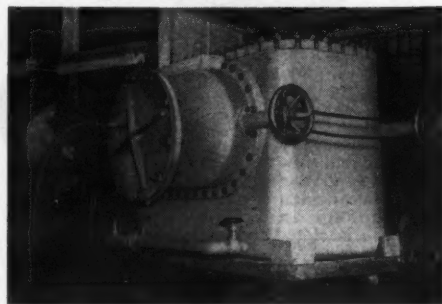
Because of remarkable heat resistance of tools, blanks may be shaped by dry grinding with diamond wheels. Resharpener is easily done on same metal-bonded diamond wheel used for sharpening carbide tools.

Test results on the tool being used on SAE 4140 steel are given in the table:

Factor	Cutting Tool Material		
	High-Density Aluminum Oxide	Carbide Grade C-6	Carbide Grade C-7
Speed (sfpm)	1000	500	500
Linear Feed (inch)	0.0075	0.0075	0.0075
Depth of cut (inch)	0.125	0.125	0.125
Tool Travel (inches)	82	80	90
Chip Platform Cratering (inch)	None	3/32	Slight
Edge (Land) Wear (inch)	1/64	3/64	2/64

(Alundum Cutting Tools are developments of Norton Co., Dept. CP, 1 New Bond St., Worcester, Mass. . . . check CP 2722 on form opposite last page.)

Not a dual-drive rocket ship— this is a duplex water strainer



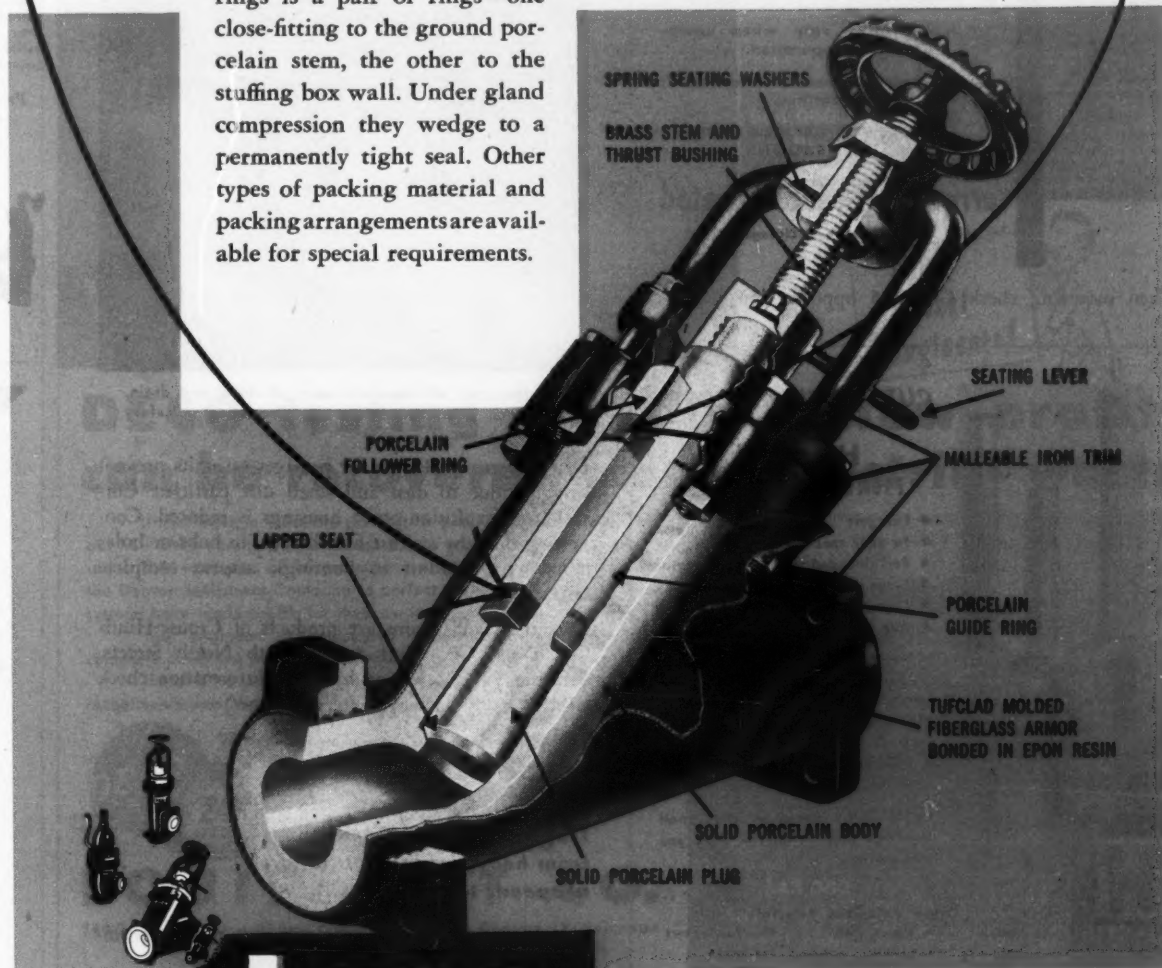
A 24-inch duplex-type strainer to be installed in a spray cooling unit at the Brookfield, Illinois plant of Reynolds Aluminum Co. receives final hydrostatic test before shipment from manufacturer's plant. Strainer is used on recirculated process water at the Reynolds plant. The two handles control disc-type gate valves which divert water flow from one side to other, make cleaning possible without interrupting operations.

(Strainer is product of J. A. Zurn Mfg. Co., Dept. CP, 1801 Pittsburgh Ave., Erie, Pa. . . . or for more information check CP 2723 opposite last page.)

Teflon Packing

... "all-service"
... maintenance-free
in Lapp Valves

Solid, unfilled Teflon, in a wedge-ring arrangement, provides a packing for Lapp Porcelain valves which is long in serviceability, short on maintenance requirements. Each of the two sets of Teflon wedge-rings is a pair of rings—one close-fitting to the ground porcelain stem, the other to the stuffing box wall. Under gland compression they wedge to a permanently tight seal. Other types of packing material and packing arrangements are available for special requirements.



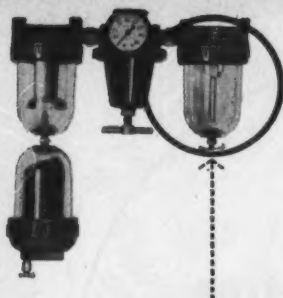
Lapp

PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipes • Raschig Rings
Pulsofeeder Chemical Proportioning Pumps

Y-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment. Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 436 Wendell St., LeRoy, N. Y.

When inquiring check CP 2724 opposite last page



for conditioning and control of compressed air **arrow**

Autopneumatic control assembly
... or individual units

TRUE MIST LUBRICATOR

Pipeline Sizes:

1/4" — 3/8"
1/2" — 3/4"
1" and
larger

1. Automatic delivery of mist lubricant proportional to air flow at any adjustment.
2. Tamper-proof adjustment of oil delivery.
3. Lubricates only when equipment is in operation.
4. Eliminates excessive or insufficient lubrication.

SEND FOR CATALOG AND
LITERATURE

arrow tools, incorporated

1904 S. Kostner Ave., Chicago 23, Ill.

When inquiring check CP 2725 opposite last page

CUT FASTENING COSTS with **HASSALL THREADED PINS**

- Low cost
- To your specifications
- Roll threaded for greater strength
- Large or small quantities
- Close tolerances
- Any finish • All metals

We are saving many of our customers from 20% to 50% on their special small threaded pins. These threaded pins may be made to your specifications in a wide variety of metals and finishes. Large or small runs are economical.

Let HASSALL quote on your small threaded pins... we can show you real savings.



ESTABLISHED 1850

Other HASSALL Specials

- Rivets
- Nails
- Studs
- Hinge Pins
- Screws
- Drive Screws
- Machine Screws
- Fasteners
- Small parts

Our 3 color decimal equivalent wall chart and our complete catalog on request.

JOHN HASSALL, INC.

P.O. Box 2196 Westbury, L.I., N.Y.



When inquiring check CP 2726 opposite last page

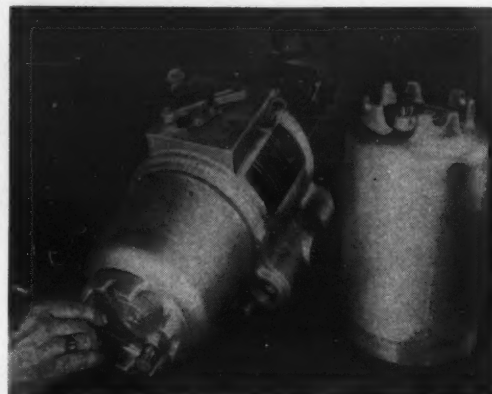
ENGINEERING & MAINTENANCE

**Explosion-proof housings
have better drain off,
more air circulation . . .**

larger air passages of breather and drain prevent clogging due to dust and small dirt particles

Uses: Venting explosion-proof combination starters and circuit breakers and other equipment housings in Class I, Groups C and D hazardous locations.

Features: Design of breathers and drains allows the passage of three to four times more volume of air than standard type. Better drain off of condensation is achieved.



Breather, top of detached cover at right, and drain, at pencil point, give more air circulation in safety

Description: Larger air passages on units prevent clogging due to dust and small dirt particles. Corrosion of explosion-proof housings is reduced. Connecting units by at least five threads, in hubs or holes tapped for conduit in housings, assures complete safety.

(Breathers and drains are products of Crouse-Hinds Co., Dept. CP, Wolf and Seventh North Streets, Syracuse, N. Y. . . or for more information check CP 2727 on form opposite last page.)

**Trap tramp iron effectively
from heavy or wet material
at speeds to 500 fpm . . .**

separation units remove magnetic particles completely and quickly

Uses: To remove tramp iron and other undesirable magnetic particles from material where these particles might cause an explosion or contaminate the product.

Features: Units have rectangular field and are designed for suspension over head of pulley or in a horizontal position over conveyor belt. They are suspended by means of adjustable-length cables. A

**Cost Less
because they
Last Longer**

**"Metalsmiths"
Stainless Steel
and Monel
Utensils**

METALSMITHS Utensils are built to the exacting needs of corrosion-resistant service in the process industries. Efficiently designed—made of correct metal analysis and weight—fabricated by latest techniques—backed by over 30 years' specialization in corrosion-resistant equipment.

Prompt shipment
—anywhere!



WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITHS
Division of Orange Roller Bearing Co., Inc.
356 White Street Orange, N. J.

When inquiring check CP 2728 opposite last page

**LENAPE
STUDING OUTLETS**
offer many
advantages

Curved Studing Outlets or Pads in ASA sizes and standards provide reinforcement of the shell opening. Studing outlets, naturally short in height and providing reinforcement of the opening, have design appeal, economy in price and fabrication, and advantages in use.

Important applications include interdeck access openings on small diameter towers or columns, boiler mountings, clean-out or observation ports, and similar uses in close-clearance locations.

Sizes 16" and larger (even to 30" I.D.) are ideal access openings and in 18" and 20" sizes are the most modern and economical manway for LPG tanks.



HYDRAULIC PRESSING
AND FORGING CO.

Complete standards on pages
36-39 of Lenape Catalog 10-33.

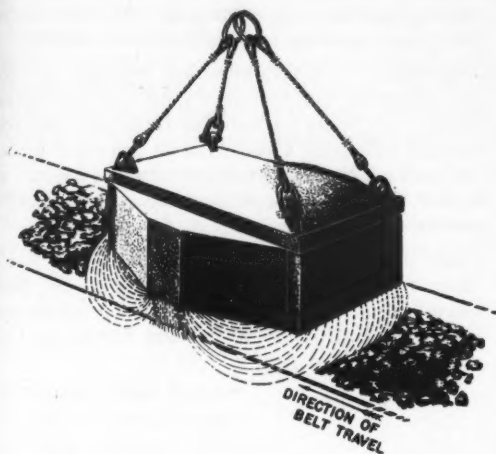
LENAPE HYDRAULIC PRESSING & FORGING CO.
DEPT. 100 WEST CHESTER, PA.
RED MAN PRODUCTS

When inquiring check CP 2729 opposite last page

CHEMICAL PROCESSING

practically uniform, high-Gauss field is produced across the belt. It lifts material out of heavy or wet burdens, or burdens moving at speeds up to 500 fpm.

Description: Rectangular electromagnetic separation magnet will give long service. Insulating materials will withstand high temperatures encountered under continuous operation. Class B insulating mate-



rials, containing a minimum of organic binders, are used throughout. High dielectric strength results in maximum electrical resistance to ground under all operating conditions.

Several models are available: these vary from Model SM20 with effective range of 6 inches at belt speed of approximately 200 fpm, up to largest Model SM60 with effective range of 19 inches at a belt speed of approximately 500 fpm.

(Super Magnetomotive Magnets are products of The Ohio Electric Mfg. Co., Dept. CP, 5400 Dunham Rd., Maple Heights, Cleveland, Ohio . . . or for more information about manufacturer's product, reader may simply check CP 2730 on form opposite last page.)

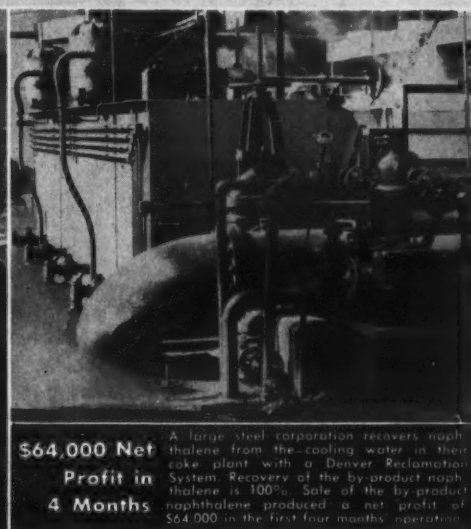
Diagrams water-tube boiler and steam generators

Photographs and diagrams of water-tube boilers and steam generating equipment are shown in 12-page bulletin. Also included are auxiliaries such as water-cooled furnaces, superheaters, economizers, air preheaters, and steam washers.

"Water Tube Boilers and Steam Generating Equipment," is issued by Edge Moor Iron Works, Inc., Div. of Condenser Service & Engineering Co., Inc., Dept. CP, 101 River St., Hoboken, N. J. When inquiring reader may simply specify CP 2731 on form which is located opposite last page.

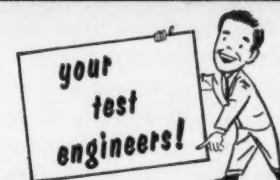
SEND SAMPLE

FOR PRELIMINARY EXAMINATION - NO COST TO YOU



\$64,000 Net Profit in 4 Months

A large steel corporation recovers naphthalene from the cooling water in their coke plant with a Denver Reclamation System. Recovery of the by-product naphthalene is 100%. Sale of the by-product naphthalene produced a net profit of \$64,000 in the first four months operation.



DECO testing lab shows how profits can be recovered from industrial waste

If you have a valuable product in your industrial waste, find out how Deco can help you recover it at a profit. These case histories are a few examples of how company engineers have worked with the Denver Equipment Company to perfect reclamation systems. These systems have made profits for their owners.

Your engineers are welcomed in our laboratories. We have complete batch test and pilot plant facilities.

There is no obligation to you for a preliminary analysis and recommendation. Write today for details on how to send your samples.



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DENVER EQUIPMENT CO.

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We are interested in tests on:

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☐ Classification
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☐ Gravity
☐ Concentration
☐ Leaching
☐ Separation
☐ Waste
☐ Reclamation

☐ Sampling
☐ Filtering
☐ Settling
☐ Thickening
☐ Drying
☐ and Water
☐ Reclamation
☐ Anti-Pollution
☐ Investigations

Name _____
Title _____
Company _____
Address _____
City and State _____

\$43,000 Saved Each Year

A Denver Reclamation System is reclaiming formerly discarded molding sand, and saving a large foundry this amount each year. Deco test investigations often can take an operator's or plant engineer's idea and develop a system producing a new profit - giving his plant a new competitive advantage in a profit-tight industry.

When inquiring check CP 2732 opposite last page

Unaffected by all chemicals normally found in industry

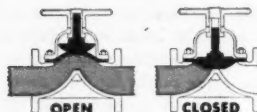
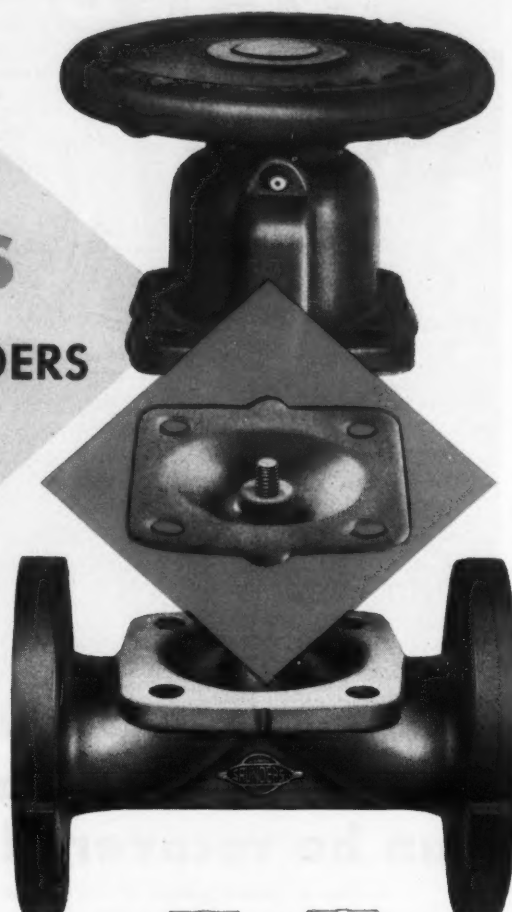
Teflon Diaphragms for GRINNELL-SAUNDERS DIAPHRAGM VALVES

Having valve trouble? Are your chemical services so tough that valves disintegrate? Grinnell-Saunders Diaphragm Valves with TEFLON* diaphragms may solve your problems.

Grinnell TEFLON diaphragms are made by a new and unique process which produces a better product of greater density, toughness and flex life. TEFLON offers a high degree of chemical inertness to all chemicals normally found in industry.

Grinnell-Saunders Diaphragm Valves are available with bodies of iron, bronze, stainless steel, cast steel, aluminum, Monel, Saran, Durimet; and with body linings of glass, lead, soft or hard rubber, neoprene, Saran. Diaphragm life depends on temperature, pressure, and frequency of operation. Your inquiries, which should be accompanied by complete service data, will receive prompt attention.

*Registered Trade-Mark, E. I. du Pont de Nemours & Company, for its tetrafluoroethylene resin.



- Diaphragm lifts full height for streamlined flow in either direction
- Resilient diaphragm assures positive, leak-tight closure even with grit or scale in the line
- Diaphragm absolutely isolates working parts from fluid . . . sticking, clogging, contamination, corrosion eliminated
- Body, lining, and diaphragm materials to suit service
- Simple maintenance. Diaphragm can be replaced easily without removing valve from line. No packing glands to demand attention. No metal-to-metal seats to become damaged or wire-drawn

GRINNELL
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 2733 opposite last page

ENGINEERING & MAINTENANCE

**Large size ball joints
hold steam to 600 psi
at temps to 1000°F . . .**

have 15° angular flex and are fire resistant

Uses: Movable joints for process, heating, chemical, or hydraulic service piping.

Features: Design on large size (8, 10, and 12") welding end ball joint permits use with steam up to 600 psi at operating temperatures up to 1000°F.

Description: Units withstand exposure to fire (45 minutes at 950° to 1200°F) and have an angular flex of 15°. Joints are available in flanged end and welding end styles. Gaskets can be general purpose: for gasoline, oil, water, and non-corrosive service; or special: for corrosive, high-temperature, or high-pressure use.

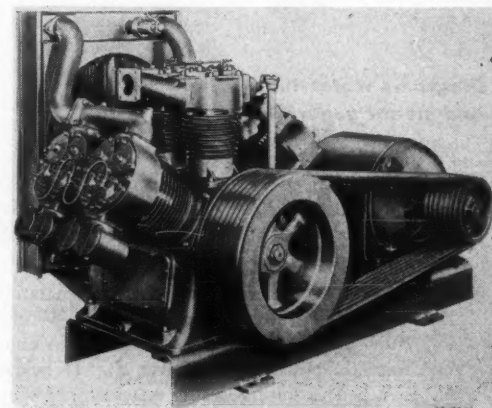
(Ball joints are available from Dept. J-4, Barco Manufacturing Co., Dept. CP, 500 Hough St., Barrington, Ill. . . or for more information reader may simply check CP 2734 on Readers Service slip located opposite last page.)

**Electric motor-driven compressors
available in 50, 75,
and 100 hp ratings . . .**

balanced design reduces vibration, noise

Uses: Stationary compressors for applications where compactness, light weight, and minimum of operator attention are required.

Features: Compressors have balanced design, which reduces vibration and noise to minimum, and prevents wear of both compressor and motor. A dual control gives operator choice of start-and-stop duty of both motor and compressor or a continuous running of motor with intermittent compressing. The latter selection permits compressor cylinders to un-



Compressors are light in weight, require a minimum of operator attention

load instead of compressing when desired pressure is reached.

Description: Two-stage, air-cooled, electric motor-driven compressors come in 50, 75, and 100 hp sizes with displacements of 260, 415, and 550 cfm respectively at 125 psi operating pressure. Model 50S2 has three cylinders and models 75S2 and 100S2 have six cylinders. Cylinders are made of alloy iron and are cooled by high-speed, belt-driven fan which draws air through a sectional-core intercooler and directs it over the cylinders and heads. Air cooling allows installation without fear of interruption in flow of water or freezing of water lines. Each bank of cylinders has individual intake filters. Forced feed lubrication is by a positive plunger oil pump.

(S series compressors are products of Le Roi Div., Westinghouse Air Brake Co., Dept. CP, 1706 S. 68 St., Milwaukee 14, Wis. . . or for more information check CP 2735 on form which is located opposite last page.)

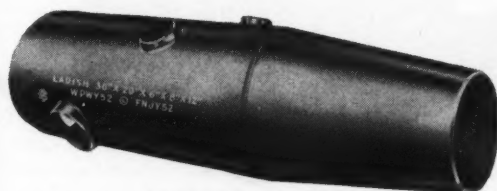
Multiple outlet header simplifies installation of connections . . .

unit can be fabricated to act as conical reducer for main pipeline

Uses: Fitting for installation of complete by-pass, blow-down, and branch connections to pipeline gate settings.

Features: Header has multiple seamless outlets in exact specified positions which simplify installation and eliminate costly practice of nozzling in branch connections and saddle reinforcements.

Description: Fitting can be equipped with factory-fabricated conical reducer. Walls are formed from

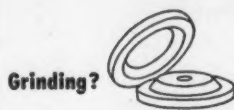


Typical header with 6, 8, and 12" outlets for connecting 30" main line to 20" pipeline

seamless pipe by forging process. Multiple outlet headers can be produced in sizes up through 42" pipe virtually without restriction as to length of header section, number, size, or arrangement of outlets, or range of conical reducer sizes.

(Multiple outlet headers are a product of Ladish Co., Dept. CP, 5400 Packard Ave., Cudahy, Wis. . . or for more information check CP 2736 on handy form opposite last page.)

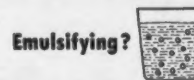
Do you have one of these problems?



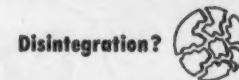
Grinding?



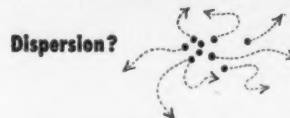
Homogenizing?



Emulsifying?



Disintegration?

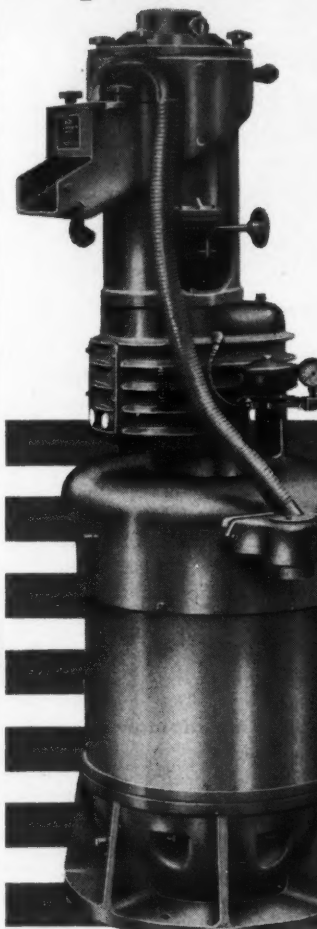


Dispersion?



Blending?

If you do... Morehouse Mills will increase your production... give you smoother, finer, more uniform products... at less cost



Modern Morehouse Mills... proved by years of development and plant operation... solve these problems for you either separately or concurrently.

Each Morehouse Mill features the Morehouse principle of vertical milling by means of high-speed non-contaminating revolving "CARBORUNDUM" stones. The models differ only in capacity, application, horsepower, speed, adjustment features

and auxiliary equipment. But these differences are the things that permit a specific Morehouse Mill to solve your specific processing problem.

Used today to process over 100 products in more than 50 countries. Regardless of the frequency, voltage or phase of the electrical current in the area where you operate, there is a Morehouse Mill to meet your needs.

And... for ultimate dispersion

The high-speed Cowles Dissolver is 2 to 20 times faster than conventional mixers!

Saves space, labor and maintenance costs. Versatile. Engineered to meet your exact requirements. Fully guaranteed. Many models.



MOREHOUSE COWLES

write or send coupon today!

Originators of high-speed stone milling equipment and sole manufacturers of Morehouse Mills Since 1898

Morehouse-Cowles, Inc., 1150 San Fernando Rd., Los Angeles 65, Calif., Cable Address: "MOROSPEED," Los Angeles
Please send complete information on ☐ Morehouse Mills; ☐ Cowles Dissolvers.

I manufacture _____
Name _____
Company Name _____
Address _____
City _____ Country _____

Capacities from 160 to 7500 gallons per 8-hr. day!
Attention! Renseignements disponibles dans des langues variées. Ecrivez-nous dans votre langue.
Purchase of Morehouse Equipment is being approved by many governments because of their contributions to the economy of the country

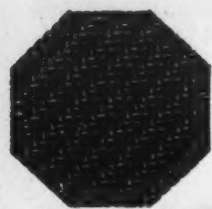
COMPACT AND LIGHTWEIGHT MOREHOUSE MILLS PROCESS FLOWABLE PRODUCTS SUCH AS: Paints • Foods • Chemicals • Greases • Ceramics • Inks • Pharmaceuticals
(corrosive or non-corrosive)

OFFERING YOU... Low first cost • Desired adjustment without stopping • Easy duplication of desired end-product • No contamination • Easy cleaning and low-cost maintenance

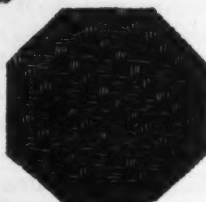
When inquiring check CP 2737 opposite last page

Newark Metallic Filter Cloth...

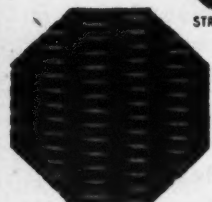
... says **STOP** to Solids



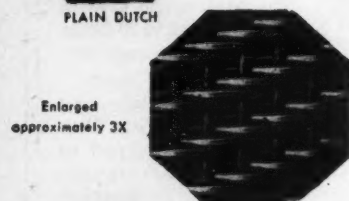
TWILL



STRANDED TWILL



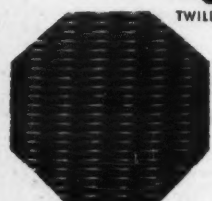
PLAIN DUTCH



Enlarged
approximately 3X



TWILL DUTCH SINGLE



TWILL DUTCH DOUBLE

Newark Metallic Filter Cloth does stop solids — the wedge-shaped openings allow only the filtrate to pass through. And, Newark Cloth is reversible, both sides being identical. Newark Metallic Filter Cloth is woven firmly and uniformly without loose wires, guaranteeing good filtration all over.

Newark Metallic Filter Cloth is available in a variety of weaves in all malleable metals, and is adaptable to practically all types of filters. When writing, please give us details on your process.

Send for our NEW Catalog E.

Newark
Wire Cloth
COMPANY

NEWARK
for **ACCURACY**

351 VERONA AVENUE • NEWARK 4, NEW JERSEY

When inquiring check CP 2738 opposite last page

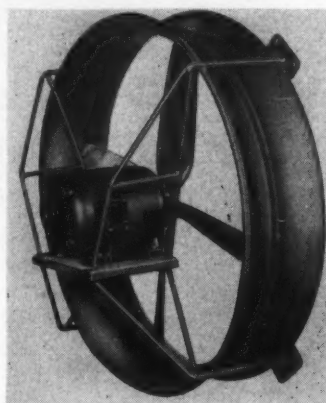
ENGINEERING

Alternate intake-exhaust provided by single fan unit...

two orifices welded face-to-face give uniform flow

Uses: For ventilating jobs requiring intake during some periods and exhaust during others.

Features: Fan is reversible, and can be driven directly, through belt or pulley drive.



Fan comes in 28, 36, and 44" diameters

Description: Reversible fan has an aluminum alloy reversible propeller and two curved orifices welded face-to-face. Models are 28, 36, and 44" in diameter.

(Double-ring reversible fan is a product of Hartzell Propeller Fan Co., Dept. CP, Piqua, Ohio... or for more information check CP 2739 opposite last page.)

Advantages of automatic grease monkey

Four-page bulletin on automatic grease monkey describes the metering plate that regulates grease flow to bearing and provides pressure relief against overgreasing.

Bul A-2406 is issued by Reliance Electric & Engineering Co., Dept. CP, 1088 Ivanhoe Road, Cleveland 10, Ohio. When inquiring specify CP 2740 on form which is located opposite last page.

Solve your needs in
PRODUCT RECOVERY
with **Banister**
Dustmasters



Dustmasters are scientifically designed, moderately priced cyclone type mechanical separators. They give you outstanding collection efficiency (in some cases up to 99.8%) with minimum power requirements. Typical of their many uses are in spray dried milk processing, in food component conveying, in vinyl resin manufacture, and in loose chemicals handling. **Dustmasters** are carefully manufactured for long life, and are available in hot rolled steel, monel, stainless steel, or aluminum.

Our wide experience and knowledge of applications can be tremendously helpful to you in getting the most practical and economical product recovery system. Our engineering laboratory will gladly run tests on your product and make specific recommendations.

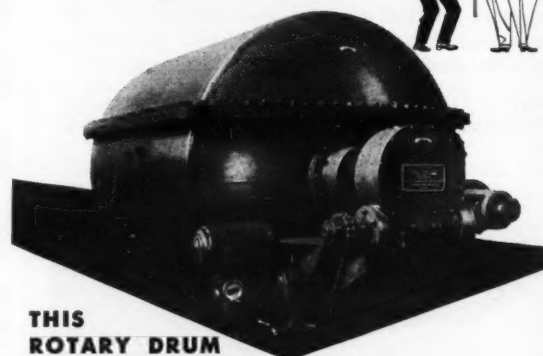
Send for catalog or send us your requirements.



A. W. Banister Co., Inc.
21 Charles St., Cambridge 41, Mass.
System engineers & manufacturers since 1911

When inquiring check CP 2741 opposite last page

A Perfect fit



THIS ROTARY DRUM PRESSURE FILTER IS TYPICAL

of the special designs G-B engineers develop to handle particular needs. The filter drum is 6'-0" in diameter by 8'-0" in length, and in this instance maintains a positive pressure of carbon dioxide on the filter cake to prevent the chemical reaction from reversing. Every detail has been worked out to fit the filter to the exact needs, rather than utilizing a "standard" filter and making the process conform to the filter.

G-B Engineers will work with you, too...
without obligation!

GOSLIN-BIRMINGHAM
MANUFACTURING CO., INC.
BIRMINGHAM - ALABAMA



When inquiring check CP 2742 opposite last page

CHEMICAL PROCESSING

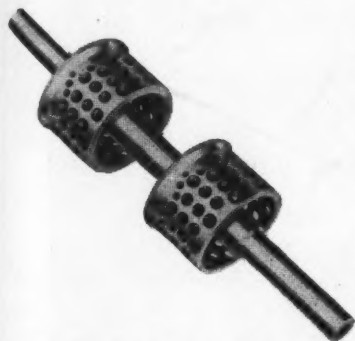
**Destructive vibration,
high noise level
eliminated . . .**

valve plug graduates pressure drop, giving longer service life

Uses: Valves subject to flashing and erosive effects of high pressure drop.

Features: Plug design eliminates the destructive vibration, trim deterioration, and high noise level which occur in valves on flashing liquid service.

Description: Threaded holes geometrically spaced around plug skirt create turbulence and dis-

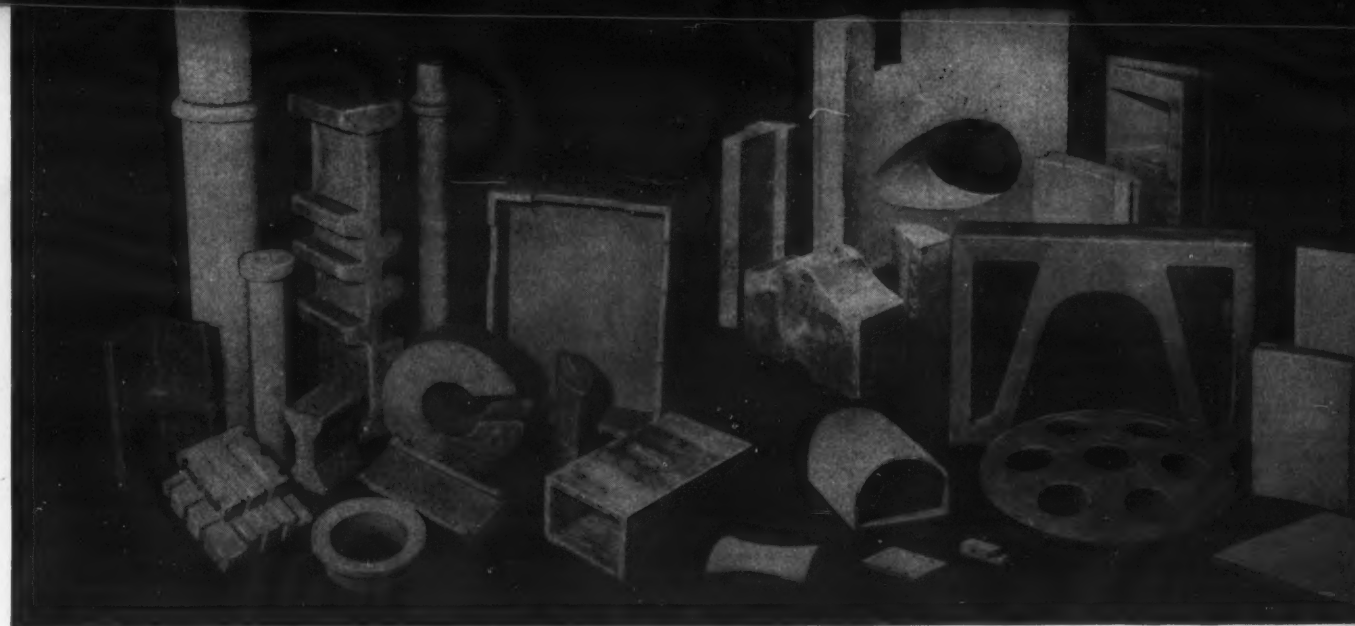


Geometrically spaced holes distribute energy release over a large surface area

tribute energy release over a large surface area. Potential energy is converted directly to heat. Temperature rise is small and damaging kinetic energy is no longer available, increasing active service life. Plugs are furnished in nominal sizes from 3 to 16" with either single or double seated construction, of any specified material.

(Flash-Flo plugs are a product of Hammel-Dahl Co., Dept. CP, 175 Post Rd., Providence 5, R. I. . . . or for more information about this product reader may simply check CP 2743 on convenient Reader Service slip which is located on form opposite last page.)

For more information on product at right, specify CP 2744 . . . see information request blank opposite last page.



IF YOU USE REFRACTORIES

. . . or castable cements

. . . or porous plates and tubes

. . . or catalyst supports

. . . or oxide, boride, nitride or
carbide high-temperature materials . . .

YOU WILL WANT THIS INFORMATION

Carborundum has pioneered scores of super refractories with a wide variety of properties to meet your most demanding requirements. In kilns, furnaces, and processing equipment, they improve operation, and stay in operation longer, to cut your costs.

A Carborundum engineer will help you to choose and apply exactly the right material to fit your needs. As a starter, get the Carborundum refractories booklet by sending in this coupon.

Dept. S125, Refractories Division
The Carborundum Co., Perth Amboy, N. J.

- ☐ Please send refractories booklet.
☐ Please have a Carborundum engineer call on me.

Name _____ Title _____
Company _____
Street _____
City _____ Zone _____ State _____

CARBORUNDUM

Registered Trade Mark

Ducon

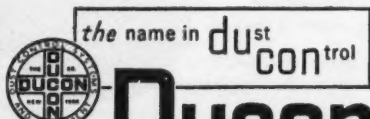
preferred



... for Dust Collection in Anaconda's Yerington Mine Operations

Ducon Cyclone Collectors are used for dust control on the various operations at Anaconda's Yerington, Nevada Copper Leaching Plant. Crushing and related operations are the starting point in the preparation of many raw materials for subsequent use, whether it be for metallurgical, chemicals or construction. From exploratory drilling through the various processes to the end product, Ducon Dust Control Equipment performs the vital service of product recovery and dust control in the many material processing operations.

Write today for full descriptive literature.



THE Ducon COMPANY

147 EAST SECOND STREET, MINEOLA, N.Y. • Sales Representatives in Principal Cities

Designers and Manufacturers of Dust Control Equipment Exclusively

CYCLONES • CENTRIFUGAL WASH COLLECTORS • TUBULAR CLOTH FILTERS • DUST VALVES

Canadian Branch: THE DUCON COMPANY OF CANADA, Ltd.
275 James Street North, HAMILTON, ONTARIO

When inquiring check CP 2745 opposite last page

engineering and maintenance



Carbon slurry is discharged onto 100 mesh screen at top of unit from overhead lines

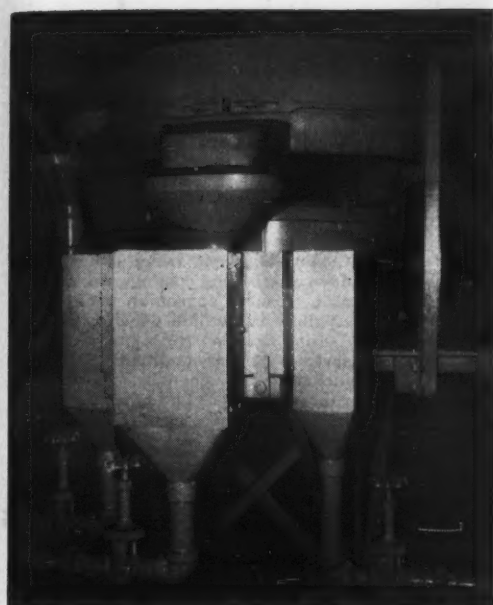
reduces maintenance of proportioning pumps

**Corn Products uses vibrating
screen to remove abrasive ash
particles from revived carbon
black slurry**

By **WILLIAM C. CLARKE**, Assistant Editor
Data verified by **ALVOR HEDBERG**
Plant Manager
Corn Products Refining Company,
Pekin, Illinois

Problem: Maintenance was excessive on proportioning pumps handling 4% (by weight) carbon-black slurry at Corn Products Refining Company, Pekin, Ill. Cylinder walls were being scored. Pumps didn't maintain calibration because of wear of moving parts.

Carbon black rather than time-honored bone char is used for bleaching syrup solutions. Slurry handled by proportioning pumps consists of carbon black from a revivification step, plus fresh make-up black. Close control of slurry feed is imperative for uniform product color. Flow rate from revivification is about 30 gpm.



Particles larger than 100 mesh are discarded through rectangular port at upper left. Separator unit vibrates on support springs

Solution: Trouble was found to be caused by ash particles, mostly silica, slipping through from revivification process.

This process consists of partially drying and then flash-heating the deactivated black to 1800°F in presence of oxygen and steam. Impurities are ashed and for the most part deposited on inside wall of an 18" ID gas-heated tube. However, some ash particle pass through the tube into the water-quench, along with the activated carbon, which is further treated with acid to pH 1.6, settled and decanted.

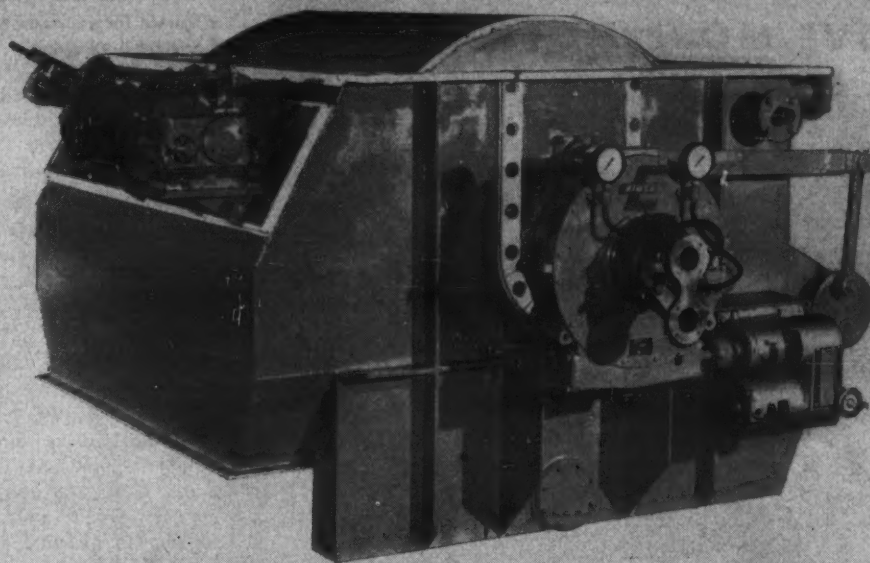
Since most of the offending ash particles were found to be larger than 0.6 mm — while the black is less than that — size separation looked to be the obvious solution to the problem.

Corn Products installed a vibratory Sweco Separator with a 100-mesh screen to remove all the troublesome particles. Unit was installed between water-quench and acid treatment steps.

Separator is 48" in diameter and has only stainless surfaces in contact with slurry. Vibratory motion of the screen sweeps particles to be discarded to one side and into a side port for collection. A small can serves as a collector. This is emptied every eight hours.

Unit is driven by 1 hp, three-phase, 1200 rpm, 440v AC motor. Vibratory frequency can be raised or lowered by changing metal weights attached to the screen. Separator handles 30 gpm without

(Continued on page 183)



Absolute Purity of Product Maintained with Eimco Filters

Absolute purity of product is maintained when using Eimco continuous vacuum or pressure filters. The picture above illustrates one of the many Eimco filters being used by industries that must maintain absolute purity such as antibiotics and other pharmaceuticals, food and allied industries and chemical industries.

To meet the requirements of these industries, Eimco makes all filters to specifications produced by cooperative efforts of the customer's engineering staff and Eimco's Research and Development engineers.

The filter shown above is a high submergence type filter designed for use with precoat material. The drum is all type 316 stainless steel and the tank is of mild steel with 1/4" thick PVC

lining. The lining is carried out through flanged connections and bolt-on-assemblies so that the white PVC material is visible from the outside. This filter is equipped with the Eimco Hyflow automatic valve for greatest efficiency in operation and the Eimco knife advance mechanism.

All of these features are significant to the type of application for this particular filter. Your problem receives the same detailed consideration by Eimco engineers who are specialized in filtration equipment. That is the reason Eimco filters work better, last longer, produce more and require less maintenance, square foot per square foot, than any other filter.

Write for more information on your specific problem.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kalamazoo, Mich. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Oxted, England Paris, France Milan, Italy Johannesburg, South Africa



B-162

When inquiring check CP 2746 opposite last page

MOVE MORE MOLASSES WITH A ROPER



For dependable pumping at slow speeds you can count on Roper Series 3600 Pumps to do the job. The pump shown is tailored for moving molasses, liquid sugar, and the like . . . its special gear tooth design and large displacement afford optimum performance through countless hours of running time. Investigate Roper as the practical approach to your situation. It will pay off in the long run. Roper Series 3600 Pumps are available in sizes 40 to 300 G.P.M.; pressures to 60 P.S.I.



GEO. D. ROPER CORPORATION
752 BLACKHAWK PARK AVE., ROCKFORD, ILL.

When inquiring check CP 2747 opposite last page

ENGINEERING

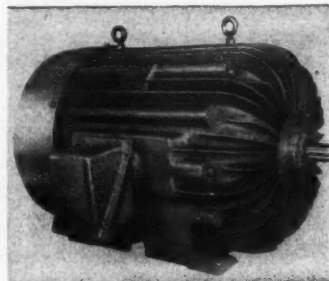
**Motor's ribbed frame
affords large area
to dissipate heat . . .**

sticky or oily dirt between ribs
can be removed while unit runs

Uses: As explosion-proof electrical motor in chemical plants.

Features: Self-cleaning effect of air stream above motor reduces maintenance. There are no ducts to clog. Sticky or oily dirt between ribs can be removed with ease and safety without stopping motor.

Ribbed frames have large area to effectively dissipate heat; coupled with axial ducts through cored ribs, maximum heat transfer is assured. Heavy cast iron construction provides rigidity and corrosion resistance to moisture and majority of chemicals. Heavy feet on casting prevent breakage.



Heavy cast iron construction provides rigidity, corrosion resistance

Description: Chemical motors have heat dissipating area of about 150% compared to standard frames. Heavy cast iron conduit box is used, all leads are sealed where they enter box. Box is diagonally split so all leads are easily accessible, and may be brought in from any 90° angle. Drain plugs are stainless.

Stator core is made of high-grade, low-loss, core-plated silicon electrical sheet, aligned and welded under high pressure to give permanent tight core.

(Chemical motors are products of Marathon Electric Manufacturing Corp., Dept. CP, Wausau, Wis. . . . or for more information about these products simply check CP 2748 on form which is located opposite last page.)

UCILON PROTECTIVE COATINGS



solve many paint problems

If you're plagued by constant maintenance and corrosion damage due to acids, alkalies, salt solutions, water and other active chemicals, here may be your answer.

A variety of Ucilon* Protective Coating Systems, using either air-drying or baking coatings, are available to solve corrosion problems. Applied like ordinary paint, Ucilon Coating Systems resist many of the severest service conditions. The line includes vinyl, phenolic, chlorinated rubber, Neoprene and other chemical resisting coatings. Send for Bulletin MC-9.

*Trademark

UCILON Protective Coatings

UNITED CHROMIUM DIVISION
METAL & THERMIT CORPORATION

100 East 42nd St., New York 17, N. Y. • Detroit 20, Mich.
Waterbury 20, Conn. • East Chicago, Ind. • El Segundo, Calif.
In Canada: United Chromium Limited, Toronto 1, Ont.

When inquiring check CP 2749 opposite last page

NO RODDING NECESSARY!



Strahman RAM TYPE Drain Valves

**The Only Drain Valve
That Cannot Clog Up!**

In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels, adaptor pads are available.

Full
Specifications
on
Application

STRAHMAN VALVES, INC. 16 HUDSON STREET
NEW YORK 13, U. S. A.

When inquiring check CP 2750 opposite last page

CHEMICAL PROCESSING

VIBRATORY SEPARATOR

(Continued from page 181)

difficulty using a single screen. Capacity is increased by raising screen frequency.

Results: Maintenance on proportioning pumps has been slashed since installation of the separator in 1953. Carbon black specifications requiring 100% through 100 mesh have been maintained despite a 30 gpm flow rate of carbon black slurry. Quality standards on color of sugar and syrup solutions have been maintained with less difficulty.

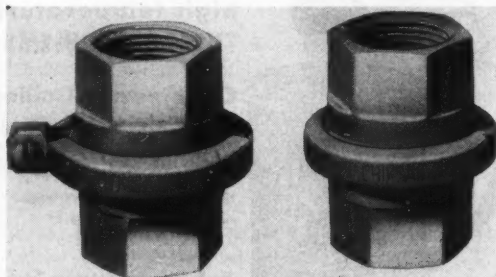
(Sweco Separator is a product of Southwestern Engineering Co., Dept. CP, 4800 Santa Fe Ave., Los Angeles 58, Calif. . . . or for more information check CP 2751 on form opposite last page.)

Versatile service given — by low cost swivel joints . . .

available with free swiveling or controlled-torque design

Uses: Coupling for hydraulic or other lines where continuous or periodic swiveling is necessary.

Features: Synthetic O-ring seal and an alloy resistant to corrosion allow units to handle aromatic fluids, cutting oils, lubricating oils, gasoline, kerosene, water, and air. Cost of joints is low.



Swivel joints can be supplied with special O-rings for use with synthetic hydraulic fluids

Description: Joints are available in two types: permanent clamp design, for use on lines where free swiveling action is required; and controlled torque design for use on lines which are required to lock into position. Units can be supplied in 1/2 and 3/4" sizes with special O-rings for synthetic hydraulic fluids. Clamps on both permanent and controlled torque design are made of cadmium-plated steel.

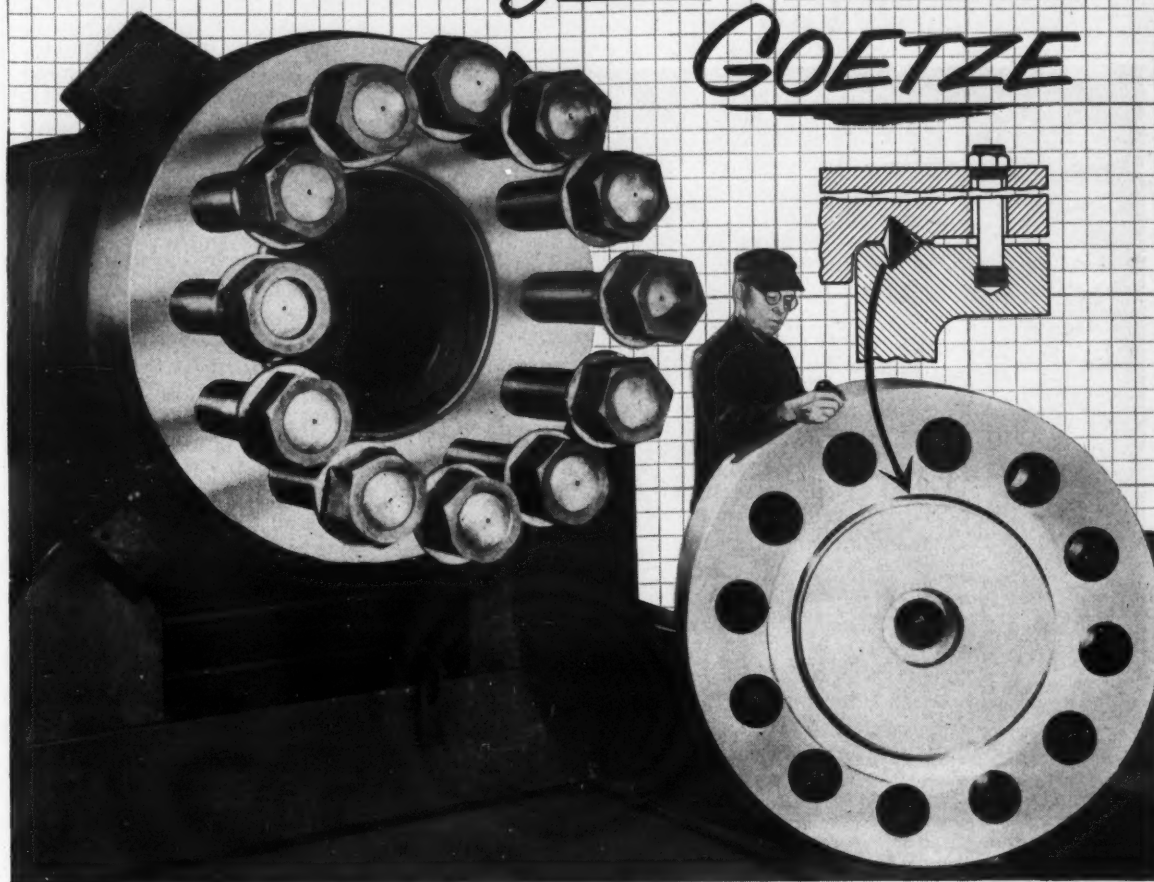
(Swivel joints are a product of Chiksan Co., Div. of Food Machinery and Chemical Corp., Dept. CP, 332 Pomona Ave., Brea, Calif. . . . or for more information check CP 2752 on form opposite last page.)

PRESSURE: 15,000 PSI

TEMPERATURE: 450 F

GASKET:

Johns-Manville
GOETZE



How A. O. Smith maintains tight seals in giant "Multi-Layer" vessels

Today's tremendous pressures and temperatures have placed special demands on manufacturers of processing equipment. A. O. Smith has answered this need with a special type of "Multi-Layer" vessel construction. And Johns-Manville in turn has provided gaskets that assure tight seals under these exacting conditions. Typical of these is the delta type gasket,

illustrated above, which was designed, for this application, to withstand pressures up to 15,000 psi. and temperatures to 500 F.

The development of special gaskets to meet special purposes has been the stock in trade of Johns-Manville's Goetze division for more than sixty-five years. Expert technicians possess a knowledge of metals and other factors related to gasket design and performance that is unmatched in the field. What's more, intensive specialization and modern production tooling

provide substantial cost savings on J-M gaskets.

If you need gaskets for high pressure vessels for similar applications, send us a drawing or template for quotation. If you have a sealing problem of any kind, J-M technicians will work directly with your own engineers to develop new gaskets—or adapt existing styles—to meet your specific requirements. Write for further information to Johns-Manville, Box 60, New York 16, N. Y. In Canada, Port Credit (Toronto), Ontario.



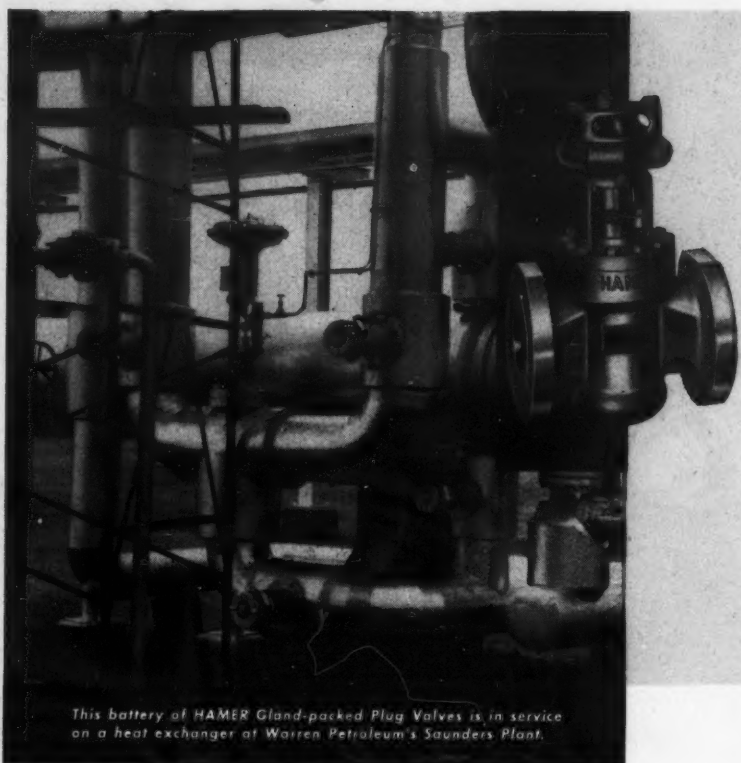
Johns-Manville PACKINGS & GASKETS

When inquiring check CP 2753 opposite last page

You can repack

HAMER G.P. PLUG VALVES

under full operating conditions



This battery of HAMER Gland-packed Plug Valves is in service on a heat exchanger at Warren Petroleum's Saunders Plant.

HAMER Line Blind Valves

Built for strength and durability, Hamer Line Blind Valves are the modern means of blinding pipe lines quickly and effectively. A one-man, one-minute operation. Cuts costs, and speeds up operations.



Shutting down to change valve packings costs dearly in time and money. That's why Warren Petroleum uses Hamer gland-packed Plug Valves. Not only can Hamer gland-packed plug valves be repacked under full operating conditions, but because of the exclusive plug adjusting nut, a feature of all Hamer Plug Valves, the valves can't stick or freeze. No matter what the time lapse or service you have positive E-Z turn control at all times.

Send for **FREE** Catalog

HAMER VALVES, INC.

2919 Gardenia Ave., Long Beach 6, Calif.
Representatives throughout the World

When inquiring check CP 2754 opposite last page

ENGINEERING

**Variable-speed drive
available in 112
assemblies . . .**

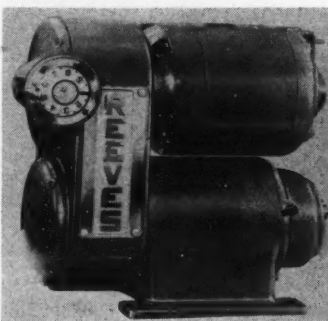
speed ranges from 2:1 through
8:1, lubricates through grooves

Uses: As a variable-speed drive
for 1-hp applications.

Features: Compact design results in a 20% saving in space over previous design. Available are 112 different assemblies so that exact space requirements can be met.

One of the outstanding features of this drive is a spiral groove lubrication system. Threaded spiral groove assures complete coverage of lubricant over all sliding surfaces. In case of excessive lubrication, an overflow outlet carries excess from disc faces and V-belt.

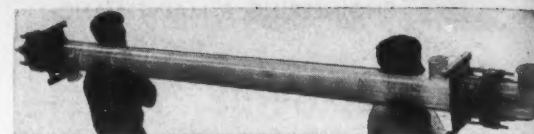
Description: Variable-speed drive comes in 1-hp size, occupies maximum space of only 16-5/16" x 21 1/2" x 11 1/2" in vertical model. Other models are equally compact. Drive combines a weatherized motor with speed changing mechanism, and heat-treated helical gear speed



Vertical model occupies maximum space of 16-5/16" x 21 1/2" x 11 1/2"

reducer, where required, in one compact package. Unit is available in speed ranges from 2:1 through 8:1. "All-position" handwheel control is standard, but mechanical automatic and electric remote controls are also available.

(No. 100 series Vari-Speed Motor-drive is a product of Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Dept. CP, 1015 N. Wilson St., Columbia, Indiana. Check CP 2755 opp. last page.)



Efficient — $h = 260 \text{ BTU/hr./ft.}^2/\text{Deg. F.}$

Cools corrosive fluids with **complete** protection

PYREX brand glass shell and tube heat exchanger

Here's a new way to safely cool, condense, partially condense, exchange or reflux corrosive fluids and fluids sensitive to metallic contamination.

It's the PYREX brand glass shell and tube heat exchanger. In this unique new unit, fluids contact only glass, chemically resistant ceramic and Teflon. It brings you relief from fouling, corrosion and contamination. You can use either the shell side or tube side for all fluids except HF or hot concentrated phosphoric acids and alkalis.

You can choose from two capacities: 13 1/2 and 50 sq. ft. Both are compact. The 50 sq. ft. unit, for example, requires only 9' x 13'6" floor space, 13" height and weighs just 165 lbs.

For complete details that show how the PYREX brand glass shell and tube heat exchanger can simplify your corrosive fluids processing, circle the reader service form at the back of this publication.



CORNING GLASS WORKS

Corning, New York

Corning means research in Glass

When inquiring check CP 2756 opposite last page

FREE BULLETIN tells



**HOW to Solve
high temperature
THREAD PROBLEMS!**

**C-5 prevents Galling
and Seizing of Studs
at temps. up to 1800°F**

- ✓ Prevents Stud Breakage
- ✓ Eliminates Pitting of Stainless Steel
- ✓ Reduces Torque
- ✓ Speeds Disassembly Time

C5 FEL-PRO "HI-TEMP" ANTI-SEIZE THREAD COMPOUND

Fel-Pro's exclusive C-5 colloidal-copper formula "copper-plates" metal, prevents locking, galling and direct contact between thread assemblies even at 1800°F without breakdown! And C-5 is safe for all metals!

Prevents galvanic pitting even where dissimilar metals are joined! Protects all threaded surfaces of bolts, plugs and studs, insuring their repeated re-use. **WRITE TODAY FOR FREE BULLETIN!** 837RR

FELT PRODUCTS MFG. CO.

1515 Carroll Ave., Chicago 7, Ill.

When inquiring check CP 2757 opposite last page

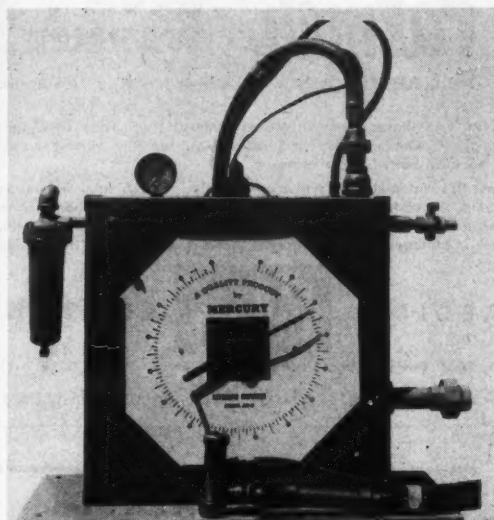
CHEMICAL PROCESSING

Dispenses accurately measured quantities of vinyl plastisol from 15 to 1600 grams . . .

unit has infinite adjustment throughout range, rapid rate of discharge

Uses: Dispensing accurately measured quantities of vinyl plastisol.

Features: Designed especially for use with vinyl plastisol, dispenser delivers exact amounts of plastic in quantities from 15 to 1600 grams.

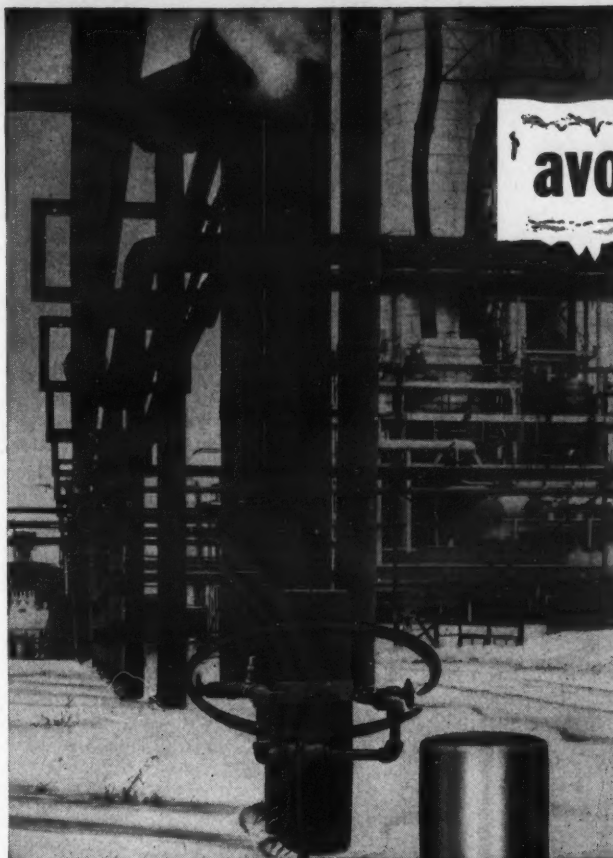


Dispenser is specifically designed for use with vinyl plastisols

Description: Unit allows infinite adjustment of quantity delivered throughout the entire operating range. Two models available have specially designed drip-proof nozzle and rapid rate of discharge. Ranges on models are 15 to 1600 grams and 12 to 1300 grams. Non-measuring manual model for bulk dispensing is also available.

(Vinyl plastisol dispensers are a product of Vinyl Plastics Div., Mercury Industries, Inc., Dept. CP, Hillsdale, Bergen County, New Jersey . . . or for more information about manufacturer's product reader may simply check CP 2758 on form opposite last page.)

Estimate filling and breathing losses for standard cone roof tanks with the nomograph on pages 206 and 208



avoid freeze-ups

... use Yarway impulse steam traps

Don't take chances with equipment freeze-ups and costly production delays. Put Yarway Impulse Steam Traps on all lines subject to freezing temperatures.

There's no danger of your lines freezing with Yarway traps. Condensate does not collect. The only moving part of the trap—a little valve—continually tests for condensate, discharges each bit as it forms.

Besides this non-freezing feature, plant men like these other Yarway Impulse advantages:

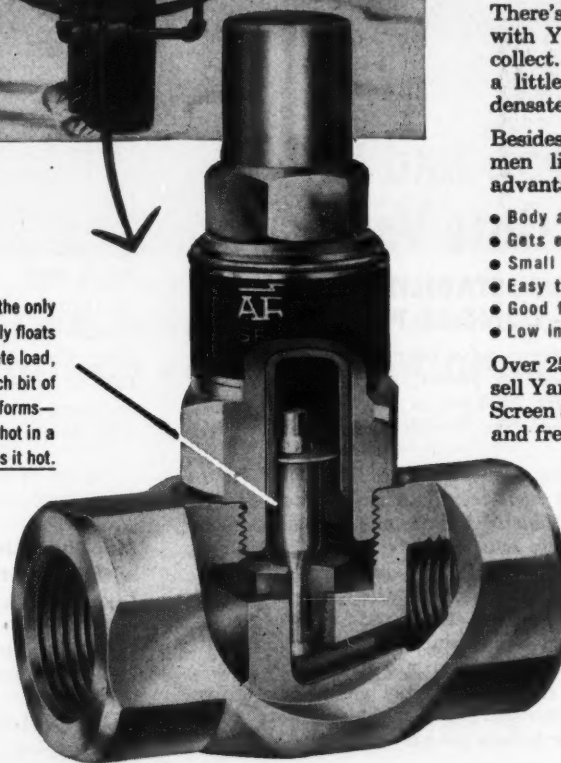
- Body and all working parts are stainless steel
- Gets equipment hot in a hurry and keeps it hot
- Small size . . . light weight
- Easy to install . . . easy to service
- Good for all pressures
- Low initial cost

Over 250 Industrial Distributors stock and sell Yarway Impulse Steam Traps and Fine Screen Strainers. For name of one near you and free trap booklet, write . . .

YARNALL-WARING COMPANY

125 Mermaid Ave
Philadelphia 18, Pa.

This little valve, the only moving part, actually floats on the condensate load, discharges each bit of condensate as it forms—gets equipment hot in a hurry and keeps it hot.



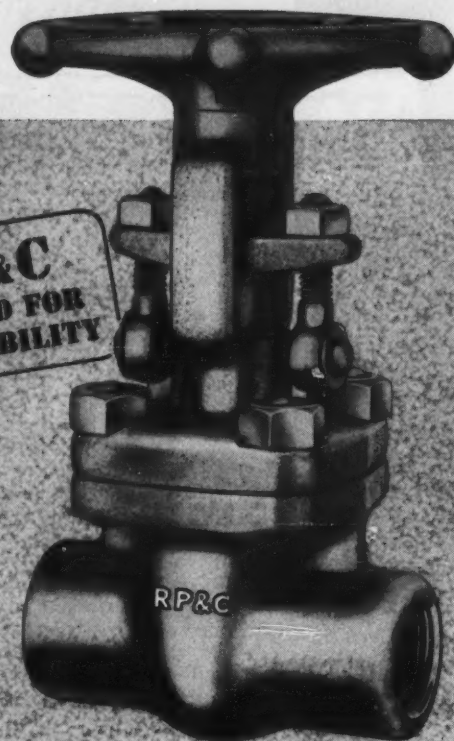
YARWAY

impulse® steam traps

When inquiring check CP 2759 opposite last page



R-P&C
DESIGNED FOR
DEPENDABILITY



New R-P&C F56 and F57 Forged Steel Gate Valves

... FOR GREATER ADJUSTABILITY,
SMOOTHER OPERATION, LONGER PACKING LIFE

• These, and many other "plus" features, have been designed into these brand-new valves specially developed for power, petro-chemical, and process piping applications. Rated for 2000 PSI at 100° F or 800 PSI at 800° F, they are furnished in sizes from 1/4" to 2" with either screwed (F56) or welded (F57) ends.

Their advanced new design includes quality features like a new "tear-drop" 500 BHN heat treated stainless steel wedge which is mated with hard chrome plated stainless steel seat rings to effectively resist seizing, galling or abrasive wear. A Flexitallic spiral-wound gasket, reusable in normal service, assures a positive tight joint. Bulky flanges are eliminated for lower weight and streamlined appearance. Follower, eyebolt, gland nut and operating nut are all stainless steel.

The end result is a lighter, yet sturdier valve which gives better service. Get the complete story. Write today for Bulletin DH-525.

R-P&C Valve Division
AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit,
Houston, New York, Philadelphia, Pittsburgh, San Francisco,
Bridgeport, Conn.

R-P&C
valves

When inquiring check CP 2760 opposite last page

ENGINEERING

**Mounted in limited space,
variable speed pulley
needs no lubrication . . .**

delivers speed ratios of 2:1,
is rated at 1/4 hp

Uses: Variable speed power
transmission from motor utilizing
belt drive.

Features: Pulley design allows
mounting in a limited amount of
space. Bronze oil-impregnated bear-
ings eliminate need for lubrication.



Pulley has speed ratios up to 2:1

Description: Speed ratios up to
2:1 are possible; rating is 1/4 hp.
Unit is fabricated from fine grained
castings with a maximum bore of
3/8" with keyway. An A section
belt is used.

(E-1350 variable speed pulley is a
product of Lovejoy Flexible Cou-
pling Co., Dept. CP, 4872 W.
Lake St., Chicago 44, Ill. . . or
for more information check CP
2761 on form opposite last page.)

**More hp in less space
with bracket & shaft
for close coupling . . .**

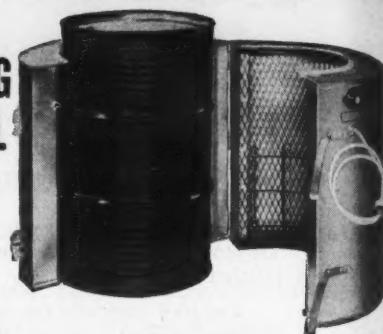
motor may be flush mounted
for accurate alignment

Uses: Motor is designed for
close-coupled centrifugal pump ap-
plications.

Features: Special shaft and face-
type registered bracket allow close-
coupling of motor to pump. Unit
has been redesigned to give more
hp in less space.

Description: Pump may be
mounted by bolting to face bracket

**WARMS
ANYTHING
IN METAL
DRUMS
UP TO
450° F**



Palmer **Automatic
DRUM
WARMER**

A PORTABLE ELECTRIC OVEN in two models for 55 or for 30 gallon
steel drums.

Saves Time—Saves Money. Makes removal from drum by dipping,
pouring or pumping, easy and convenient, for any viscous material
that handles better when warm.

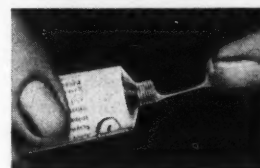
Operates automatically and economically. Two hinged halves, well
insulated, fit around drum at point of use—eliminates handling hot
drums. Supplied for 115, 208, 230 or 460 volts, single, or three
phase. Catalogue, prices and specifications on request. Write today!

HAROLD L. Palmer COMPANY

2980 West Davison Ave., Detroit 38, Michigan, Phone TUluse 3-1100

When inquiring check CP 2762 opposite last page

**NO MATTER WHAT YOUR
LEAKING JOINT PROBLEMS ARE**



Leak Lock clings in tough films
that stretch rather than break

**IT MAY PAY YOU
TO TRY LEAK LOCK
LIKE OTHER
MAINTENANCE MEN
HAVE DONE**

For 5 years, Leak Lock has been surprising skept-
tical people who didn't expect to find a "barrier"
for an "impossible-to-hold" material. They were sur-
prised at the broad scope of its capabilities.

Leak Lock is being ordered regularly by a well-
diversified list of important concerns who regard it
as a "find" for special uses.

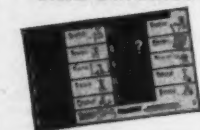
Send for information and a sample. And here's
a tip: Don't depend on a lab. test. Try it on the actual
job, and then you will know.

Leak Lock

HIGHSIDE CHEMICALS COMPANY
A UNIT OF STEWART INDUSTRIES INC.
16 COLFAX AVENUE CLIFTON, N. J.

When inquiring check CP 2763 opposite last page

CHEMICAL PROCESSING



FREE WALL CHART
"How to Protect Your Valves"

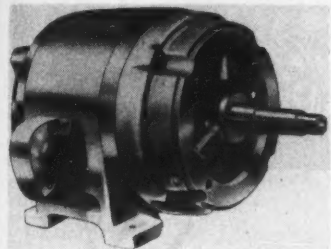
17" x 11" wall chart
gives installation and
operation pointers to
protect valves, pro-
long life. Free on re-
quest.

ACCO



ENGINEERING

to insure accurate alignment of pump and motor. Solid flange and brass slinger prevent water from entering unit. Split conduit box can be rotated in 90° steps and windings are asbestos protected. Motor is available in ratings from 1 to 30 hp.



Motor conduit box can be rotated in 90° steps

(U. S. Uniclosed pump motor is a product of U. S. Electrical Motors Inc., Dept. CP, PO Box 2058, Terminal Annex, Los Angeles 54, Calif. . . or for more information check CP 2764 on form opposite last page.)

Covers custom extruding, molding and finishing

Manufacturer's custom extruding, molding, and finishing techniques are shown in eight-page bulletin. Photographs show laboratory control, molding processes, and wide variety of compression molded and extruded parts. Also shown are ASTM compounds and characteristics including natural rubber, GR-S, Buna-N, neoprene, and butyl.

A chart lists ten basic vinyl compounds by number, showing physicals, recommended uses. Finishing operations of vulcanizing, heat splicing, and forming, punching and palletized packing are also described.

"Custom Molded Extruded Products" is issued by Geauga Industries, Dept. CP, Middlefield, Ohio. When inquiring check CP 2765 on the convenient Reader Service slip opposite last page.

FOAMGLAS®

the cellular, stay-dry insulation



Lion Oil Co. maintains peak ammonia production because . . .

FOAMGLAS stays dry for constant insulating protection on refrigerated lines and vessels

Production of anhydrous ammonia at Lion Oil Company's Luling, Louisiana Plant requires extensive use of refrigerated lines and vessels. Precise control of temperatures (down to 12°F.) helps hold compressor suction pressure at 25 p.s.i. for peak production. Effective insulation is a must . . . but the area's prevailing high temperatures and humidities pose some tough insulating problems. FOAMGLAS solved them and gave Lion Oil these important benefits:

- The sealed glass cells of FOAMGLAS are unaffected by high humidity. That means *constant* insulating efficiency for dependable temperature control.
- Effective, *stay-dry* insulation prevents condensation on lines and vessels . . . thus cuts costly corrosion.
- Service to equipment is easily accom-

plished by cutting through the FOAMGLAS, then replacing only the insulation in the area immediately affected.

Recent inspection by Lion engineers showed FOAMGLAS was fully as effective as when originally applied in 1953. Maintenance has been negligible.

Whether you insulate piping, equipment or buildings, it will pay you to find out more about the *constant, long-lasting* insulating protection of FOAMGLAS. Send today for a sample and literature covering your specific needs.

Pittsburgh Corning Corporation

Dept. CP-125, One Gateway Center
Pittsburgh 22, Pennsylvania

In Canada: 57 Bloor St. W., Toronto, Ontario

Visit our Booth No. 38 at the CHEMICAL SHOW,
Philadelphia, December 5th to 9th

When inquiring check CP 2766 opposite last page

Light, rigid, easily shaped and fitted with available tools . . . FOAMGLAS can be swiftly and simply applied to piping and equipment of every size and shape. Insulation Contractor: B & B Engineering and Supply Company, Inc., Houston, Texas.



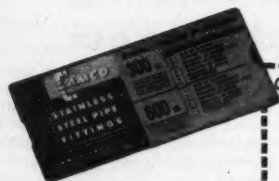
SPECIFY **CAMCO**



Heavy Duty stainless pipe fittings when high pressure, temperature and corrosive conditions require their use.

2000#, 3000#, 4000# and 6000# Screwed and Socketweld Fittings

In addition to manufacturing a complete line of 150 lb. stainless steel screwed fittings CAMCO can supply your requirements in pressure rated heavy duty stainless steel pipe fittings. Most of the popular sizes and items are available from stock in types 304, 304ELC, 316 and 316 ELC stainless steel screwed and socketweld fittings. Wide reinforcing bands insure maximum strength at points of stress and extend well beyond the last thread or depth of socket. All fittings permanently identified with size, alloy, pressure rating, heat code and trademark.



FILL IN
AND
MAIL

TODAY

CAMCO Products, Inc., 445 State Street
North Haven, Conn. CP

- ☐ Please send Flange Dimensional Slide Rule.
- ☐ Catalog No. 653 covering complete line.
- ☐ Furnish address of area distributor.

Name
Company
Address
City State



**445 STATE STREET
NORTH HAVEN, CONN.**

When inquiring check CP 2767 opposite last page

ENGINEERING & MAINTENANCE

Lightweight electric plant delivers 1500 watts

Uses: Lightweight portable electric power plant.

Features: Is extremely lightweight, equipped with tubular aluminum carrying frames as standard equipment. One model is designed for stationary service, but has carrying frame and 2-wheel dolly optional. They have extra large, long-life bearings; rotating Stellite-faced exhaust valve, solid Stellite exhaust insert; built-in governor, and high-tension, radio-shielded magneto ignition. Units run about 3 hr on one gal of gasoline at full rated load.

Description: Model 105AK is 1500 w, 60 cy, AC electric plant. It's offered in two versions: Model 1P, weighing 125 pounds with carrying frame, and Model 1M, weighing 130 pounds with carrying frame optional. All-climate generator is direct-connected to a 4-cycle, air-cooled gasoline engine.

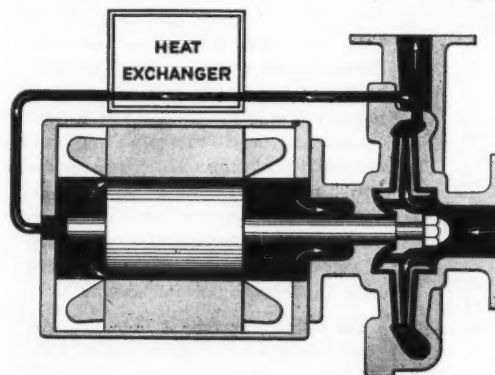
(Portable electric plants are products of D. W. Onan & Sons, Inc., Dept. CP, University Ave., S.E. at 25th St., Minneapolis 14, Minn. . . or for more information check CP 2768 on form opposite last page.)

Canned pump handles fluids at temp up to 1000°F with heat exchanger . . .

integrally-contained unit prevents hot fluid from damaging rotor chamber

Uses: For pumping Dowtherm, Arochlor, hot fats, hot oils, and similar fluids at temperatures as high as 1000°F.

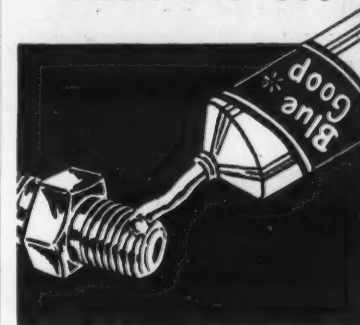
Features: Unit contains an integral heat exchanger with a special high temp pump design. Hot fluid cannot damage rotor chamber. A "necked down" area



Canned pump has integral heat exchanger for high-temperature operation

between motor and pump sections (see illustration) provides both a thermal barrier and a narrow restriction for passage of hot pumped fluid. A secondary impeller, mounted on rotor, circulates rotor cham-

No Galling of Threaded Parts When You Use



Swagelok®

GOOP*

New Swagelok Goop thread lubricants are used to eliminate the "welding action" or galling in pulling up threaded parts of stainless steel, nickel, Monel, titanium and aluminum. A light application of Goop to threads so protects them that the threaded parts can be used over and over again.

Swagelok Goop lubricants available in two types:

- Blue Goop for use on titanium, stainless steel and aluminum for temperature ranges up to 400° Fahrenheit.
- Silver Goop for use as an effective antiseize compound for use on stainless steel and high temperature alloys for temperature ranges up to 2,000° Fahrenheit.

Swagelok Goop is made by the Crawford Fitting Company, makers of Swagelok Tube Fittings.

Generous Free Sample

Write today for complete information and a sample tube of Swagelok Goop. Address Dept. C5.

*T. M. Patent Applied For

CRAWFORD FITTING CO.

884 E. 140th Street
Cleveland 10, Ohio

When inquiring check CP 2769
opposite last page

CHEMICAL PROCESSING

ber fluid through a water cooled heat exchanger mounted in circulation line. Intermixing of these fluids is very slight.

Description: Two Chempump model series with this design are available. Model CHS pumps come in 5 and 7½ hp sizes, Model CFT units in ¾ and 1½ hp. Max head developed is 195 ft and max capacity is 250 gpm.

(High-temp leak-proof pumps are products of Chem-pump Corp., Dept. CP, Station I, 1300 E. Mermaid Lane, Philadelphia 18, Pa. . . or for more information check CP 2770 on form opposite last page.)

**Controls pressure changes
Induced in oil-filled
transformers . . .**

breather valve can be mounted externally without additional protection

Uses: For control of temperature-included pressure changes in oil-filled power transformers.

Features: Unit is rugged in both construction and design and can be mounted externally without additional protection.

Description: Transformer breather valve meets ASA C57.12a requirements. A standard gage connection is used and no additional piping is required. Valve also incorporates a manually-operated sampling valve with hose barb connection. Screened inlet and outlet are provided.

(Circle Seal P-391 transformer breather valve is a product of James-Pond-Clark, Dept. CP, 2181 E. Foothill Blvd., Pasadena 8, Calif. . . or for more information check CP 2771 on form which is located opposite last page.)



**Your guide to more ideas concerning
Engineering and Maintenance . . .**

is the handy Product Directory on pages 218 to 220. All products and services discussed in this issue, in either editorial or advertising, are listed there.

NO FUNNEL ACTION

because both QCF Regular Round and QCF Rectangular Port Valves have port areas at least equal to the pipe itself. Result: no turbulence to flow of viscous ladings and no restrictions to cause abrasion . . . no loss of head pressure . . . all highly desirable features throughout the processing industries.

Other important features are quick, quarter-turn shut off and Teflon* head seal gaskets, resulting in substantially lower maintenance costs.

Representatives in 50 Principal Cities are ready to show you how to keep down valve maintenance costs. Write for Catalog 5, CP-12, Valve Division, QCF Industries, Incorporated, 1501 E. Ferry Street, Detroit 11, Michigan.

QCF TRADE NAME



QCF



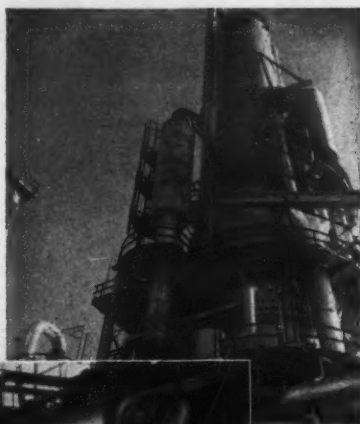
PLUG VALVES

When inquiring check CP 2772 opposite last page

Yes,
we're both
engineers
—but we
specialize
to

STOP THAT
annoying, costly—
air, steam and gas
discharge
NOISE
and
Pipeline Vibration

with
BURGESS-MANNING SNUBBERS



Just as you specialize in your field of plant design — power — or process, so we specialize and qualify to analyze and correct your problems of noise and pulsation. Our ability to qualify is based on our knowledge of:

1. the type of plant undertaken (petroleum, chemical, industrial or power plant);
2. the science, cause and effect of problems of noise;
3. the art of correcting the problem of noise, pulsation, etc. thru the adaptation of the Burgess-Manning Snubbing Principle, which has been thoroughly proved in many fields over many years.

For many problems, Burgess-Manning Snubbers are designed to integrally incorporate such plus features as air cleaning . . . or spark arresting . . . or surge control . . . or water separating . . . or heat recovery, etc.

Your noise problems can . . . and will be solved by using a dependable Burgess-Manning Snubber. Let us help you.

FREE Six case histories showing successful installations. Your specific problem may be explained. Write today.

BURGESS-MANNING COMPANY

Sound Engineering 721 East Park Avenue, Libertyville, Illinois
Dallas, Texas

When inquiring check CP 2773 opposite last page

ENGINEERING

**Very short length
saves space . . .**

motor can be either open frame
or totally enclosed

Uses: Flange-mounted motor is
suitable for use where space is short
and end mounting is impossible.

Features: Design of unit gives
unusually short length.



Flange dimensions are suitable for
interchangeable mounting with all
other standard end mounted units

Description: Motor can be fur-
nished in either open frame or
totally-enclosed, fan-cooled styles.
Flange dimensions are suitable for
interchangeable mounting with all
other popular makes of standard
end mounted units. Sizes are in 1-
to 15-hp range for vertical or hori-
zontal operation.

(Flange-mounted motor is a prod-
uct of Century Electric Co., Dept.
CP, 1806 Pine St., St. Louis 3,
Mo. Check CP 2774 on form op-
posite last page.)

**Describes globe valves
for throttling, closure**

Detailed sectional view depicts
design and construction features
of globe valves for throttling
and closure service in two-page,
two-color bulletin. Nominal sizes
available and complete parts list
are included.

Bul H-2 is issued by LaBour
Company, Inc., Dept. CP, Elk-
hart, Indiana. When inquiring
specify CP 2775 on form op-
posite last page.

JUST SET THE DIAL . . .

FOR A REPRESENTATIVE
SAMPLE OF A SAMPLE

**AMERICAN
SAMPLE
CRUSHER**

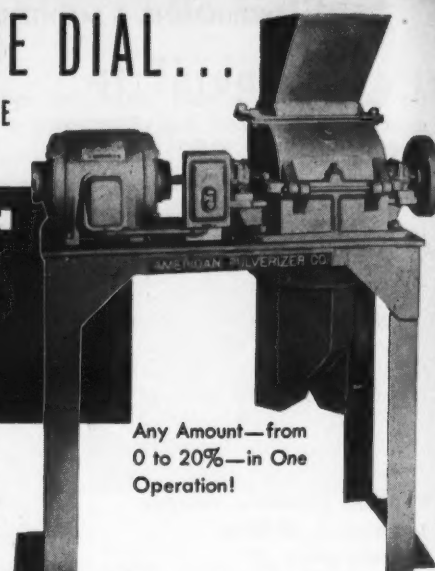
WITH NEW
ADJUSTABLE
SAMPLING HOPPER

Does the job so quickly, effi-
ciently, there's no loss of moisture
content in sample.

FAST Up to 1 tph (Model
15 x 9); ½ tph
for Model 9x9
(shown).*

EFFICIENT Once-through and
the job's done!

LOW COST Practically no wear
to an American
Sample Crusher.



Any Amount—from
0 to 20%—in One
Operation!

*for capacities up to 6 tph,
American recommends the
"13" series. Literature on
request.



1241 MACKLIND AVE. • ST. LOUIS 10, MO.

When inquiring check CP 2776 opposite last page

**NEFF & FRY
BINS ARE
DRY INSIDE**



When we erected 17 bins for
Johns-Mansville Corporation at
Fort Worth, one specification was
that the bins must show no signs
of leakage or dampness after test-
ing with direct impact of water
through a standard fire hose
nozzle. The bins are used for han-
dling and storing slate granules of
various colors for roof coverings.

"The photograph indicates
the water resistance of your bin

which was tested in a most rig-
orous manner," wrote L. A. Benton,
Johns-Mansville Project Engi-
neer. "The installation has been
very satisfactory."

No matter what kind of
flowable bulk materials you use,
you'll exercise good judgment by
selecting our bins. Better ask for
our folder, "Bins With the
Strength of Pillars."

THE NEFF & FRY CO. • 166 Elm St. • Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS

When inquiring check CP 2777 opposite last page

CHEMICAL PROCESSING

**Quickly and safely
remove or install
pipes and tubes . . .**

large size tool takes units to 4½ inches ID

Uses: Tube removal tool for large sizes of pipe and tube.

Features: Tool quickly and safely removes or installs pipe of small and large sizes. Internal design of tube is such that it cannot budge, split, or crack the tube no matter how light it may be. It will handle all types of tube and pipe; metal, fiber, glass, plastic, composition. It does not bite out any metal from the pipe and does not tear or shred inside.

Description: Pipe and tube removal tools come in sizes for ½ to 4½" ID. To use, insert proper size into pipe or tube. Expand the six movable knurled-surface segments on the inserted end by simply hand-turning knurled head on other end. Expandable segments move up the bevel until they make inside contact. To secure a non-slipping grip, tighten knurled segment with a wrench on hex nut of head. Pipe or tube can now be moved in or out by using a wrench on the hex body of the tool. When tool is on-center, even leverage is obtained.

(Tube Tule is a product of Double T Products Co., Dept. CP, 301 Acacia St., Hawthorne, Calif. . . or for more information check CP 2778 on form opposite last page.)

**Paint of many uses
permits reduction
of inventories . . .**

one-coat vinyl paint goes on exteriors, interiors

Uses: As all-purpose paint, suitable for both interior and exterior applications on cement, concrete, brick, wood, plaster, and on wallboard.

Features: Liquid paint can be applied on either wet or dry surfaces. When used on damp masonry, it prevents further water penetration. It is so formulated, however, as to permit free and constant breathing through its plastic film, thus releasing all internal moisture. It resists mild industrial acids, alkalis, grease, oil, fats, and dirt, and does not bleed or discolor when applied over asphalt.

Description: One-coat vinyl plastic paint is available in eight colors, white and clear. Because of its many uses, it enables plants to substantially reduce their paint stocks. It can be applied with brush, roller, or spray gun. No special surface preparation or primer is necessary. Drying takes place in 1 to 2 hours.

(Seal-Kote is a product of The Wooster Sealkote Co., Dept. CP, Wooster, Ohio . . . or for more information check CP 2779 on form which is located opposite last page.)

NEW

from GARLOCK...

MECHANIPAK* SEALS

FOR PROCESS PUMPS



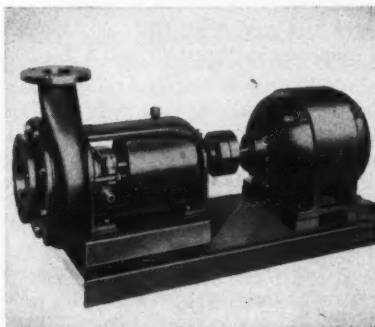
Cutaway photo of Garlock Unitary Seal Type AA51B-23. Yellow shading indicates liquid being sealed.

▶ **One Piece Assembly**

▶ **Quick, easy installation**

▶ **Pre-set at factory**

▶ **Maintenance-free life**



Typical chemical pump for which Garlock Unitary Seals are designed.

SAVE installation time, eliminate maintenance costs with Garlock's new Unitary Mechanipak Seals for process pumps!

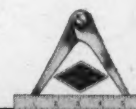
The entire unit, including sleeve and gland, is furnished completely assembled. The seal is pre-set at the factory—no on-the-job adjustments are needed. The external lock and drive is readily accessible—eliminates set-screw drive.

Get all the facts today! Phone your Garlock representative or write for new Folder AD-151.

The Garlock Packing Company, Palmyra, New York

Sales Offices and Warehouses: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, Los Angeles, New Orleans, New York City, Palmyra (N.Y.), Philadelphia, Pittsburgh, Portland (Oregon), Salt Lake City, San Francisco, St. Louis, Seattle, Spokane, Tulsa.

In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.



GARLOCK

*Registered Trademark

When inquiring check CP 2780 opposite last page



0 to 250 lbs.?



Without Adjustments

Peak Performance

Faster Warm Up

Universal Pressure

Reduced Wear

Low Inventory

0 to 250 lbs.

**Just Order by Pipe Size
(1/2" thru 2")**

GREATER CAPACITY

Write for Bulletin 800C

"WHERE Good Connections COUNT"

PERFECTING SERVICE COMPANY

334 Atando Ave.

Charlotte, N. C.

Baltimore — Camden, N. J. — Chicago — Cleveland — Los Angeles — New York — Providence — Montreal — Toronto

When inquiring check CP 2781 opposite last page

**Prevent Excessive Wear
to Vessel Liners by Arm-
oring them with . . .**

**KLEMP HEXTEEL and
FLOORSTEEL**

Hexsteel and Floorsteel are carbon or stainless steel armor and retainers for castable refractory monolithic linings. They prolong the life of an installation by retarding abrasive and corrosive action! Our engineering department is prepared to design your total lining requirements. Speedy delivery guaranteed!



Write
for your **FREE**
copy of "Klemp
Data and Spec-
ification
Manual."



KLEMP METAL GRATING CORP
6601 South Melvina Avenue
Chicago 38, Illinois

KLEMP METAL GRATING CORPORATION CP
6601 South Melvina Avenue, Chicago 38, Ill.

Gentlemen:
Kindly send me a copy of your "Data and Spec-
ification Manual."

Name _____
Firm _____
Address _____
City _____ State _____
Phone _____

When inquiring check CP 2782 opposite last page

ENGINEERING

**Reduces moisture content
of atmospheric air
entering tanks**

Uses: Breather for storage tanks for oils, chemicals, air, gases, or other materials.

Features: Unit provides inexpensive method of reducing moisture content of atmospheric air entering tanks during transfer operations or due to temperature changes.

Description: Breather consists of permanent brass housing and transparent drying chamber insert, filled with an indicating chemical drying agent. Chemical changes color as moisture is absorbed and can be reactivated by oven baking until original color returns. Drying chamber is inserted and removed without tools.



Device is available in three stock sizes with capacities ranging from 500 to 5000 gallon tank

size. Ratings are based on standard conditions of 80°F, 92% relative humidity entering air with a mass flow rate pressure drop not exceeding 1 psi.

(Indicating dry air breathers are a product of McIntire Co., Dept. CP, Okner Pkwy., Livingston 11, N.J. Check CP 2783 on form opposite last page.)

Technical information on pillow blocks

Engineering drawings, dimensions, shaft sizes, weights, and radial load ratings of ball bearing pillow blocks are shown in 52-page bulletin. Complete technical information and cutaway views of each unit are shown.

Bul A-638 is issued by Dodge Manufacturing Corp., Dept. CP, Mishawaka, Ind. Specify CP 2784 opposite last page.

* Handle a variety of tough corrosives without danger of rust or contamination.



**Buna N Pumps, Valves
and Fittings**

VANTON'S new Buna N line resists most inorganic acids, alkalis, salts and fumes, as well as many organic chemicals . . . at temperatures up to 225°F.

Centrifugal pumps with open or closed impellers ranging in capacity from 20-130 gpm, head to 100 feet, suction 2" and discharge 1 1/2".

Globe, angle and Y valves with metal reinforced stems and discs, and readily renewable seating surfaces of soft rubber. Float valves, foot valves, strainers and check valves. Sizes range to 4".

Pipe & fittings — plain or threaded. Tees, elbows, couplings, crosses, bushings, flanges, unions, cocks, plugs, and caps. Full flow capacity and high strength. Working pressures of 50 psi.

Bulletin HR-2 tells the full story. Write today for free copy.

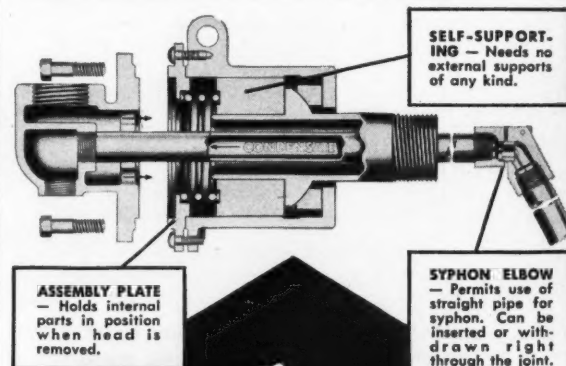
VANTON corrosion resistant products for fluid handling include flex-i-liner plastic pumps, polyethylene valves and PVC pipe and fittings. Bulletins on request.



VANTON
PUMP & EQUIPMENT CORP.

Division of Cooper Alloy Corp., Hillside, N. J.

When inquiring check CP 2785 opposite last page



**SELF-SUPPORT-
ING** — Needs no
external supports
of any kind.

ASSEMBLY PLATE
— Holds internal
parts in position
when head is
removed.

SYPHON ELBOW
— Permits use of
straight pipe for
siphon. Can be
inserted or with-
drawn right
through the joint.

Johnson
Rotary Joint
with **SYPHON ELBOW**

Johnson Joints represent the best way industry has yet found to get steam or liquids into rotating rolls and cylinders. They are completely packless, need no lubrication or adjustment. The Type SBP shown gets steam in, condensate out, through the same head. Other types available for through flow service, in sizes to meet all operating needs.

WRITE FOR COMPLETE INFORMATION.

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 2786 opposite last page

CHEMICAL PROCESSING

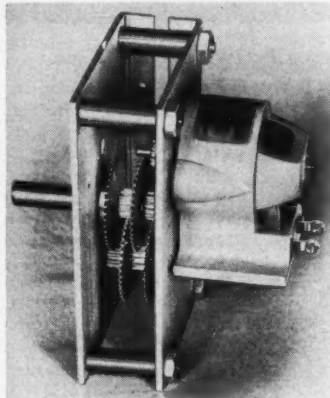
**Driven by two dry cells,
motor gear train needs
no outside power . . .**

delivers high power at low speeds with 662 to 1 gear ratio

Uses: Provide high power low speed drive where outside power source is not available. Suitable for metering devices, recording meters, or remote control handling mechanisms.

Features: Motor and gear train unit is powered by dry cells or other batteries in $1\frac{1}{2}$ to 3 or 3 to 6v range.

Description: Motor speeds at no load vary from 2000 to 10,000 rpm depending on type of brushes and applied voltage. Gear ratio of 662 to 1 reduces speed to from 3 to 15 rpm. Motor is reversible and entire unit is $3\frac{1}{8} \times 3 \times 2\frac{1}{8}$ ". Drive shaft is $\frac{1}{4}$ " in diameter and ex-



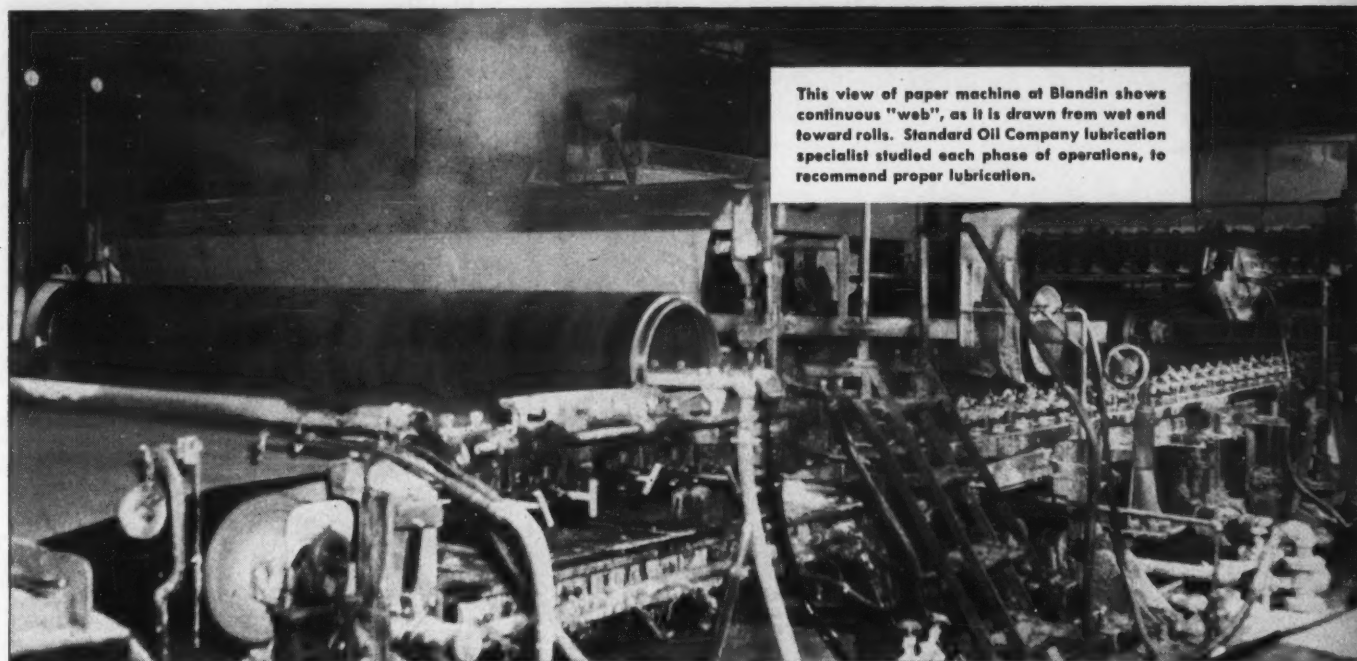
Motor speeds at no load vary from 2000 to 10,000 rpm

tends $11/16$ " beyond main bearing of gear unit. Reduction is through stamped or powdered metal gears on shafts running in Oilite bearings.

(Hi-drive motor and gear train unit is a product of Wilson's of Cleveland, Dept. CP, 425 Lakeside Ave., N. W., Cleveland 13, Ohio. . . . check CP 2787 opp. last page.)

For more information on product at right, specify CP 2788 . . . see information request blank opposite last page.

STANOLITH GREASE *overcomes trouble spot, keeps paper rolling at BLANDIN*



This view of paper machine at Blandin shows continuous "web", as it is drawn from wet end toward rolls. Standard Oil Company lubrication specialist studied each phase of operations, to recommend proper lubrication.

STANOLITH Grease aided the solving of a rough lubrication problem at Blandin Paper Company in Grand Rapids, Minnesota.

A bottleneck on the paper making machines threatened production at this hustling paper plant four years ago. The trouble occurred near the beginning of the process, where the pulp contains up to 99% water. At this point, bearings are greeted by a shower of water and stock.

Greases were quickly lost, literally washed away. Bearings were ruined early in life. Not only had greases failed in their duty but they caused paper staining.

A Standard Oil lubrication specialist recommended STANOLITH Grease for use on the wet end of the paper machine. It did such a good job that Blandin maintenance personnel put this multi-purpose grease to work on other applications, too. Now, except when open gear and brick greases are required, STANOLITH serves the entire plant, replacing a wide number of single-duty products.

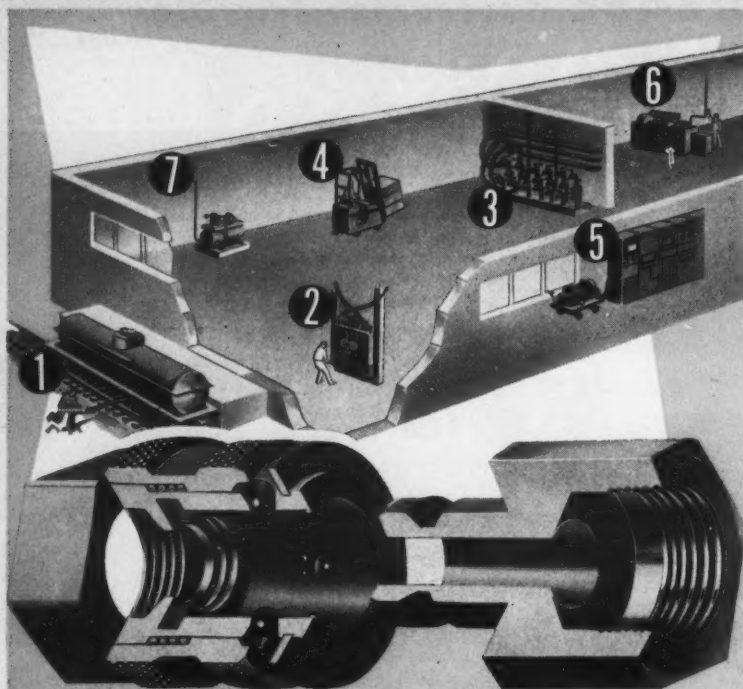
STANOLITH is truly a multi-purpose grease. It may be used almost anywhere on the job, in mechanical or hand-operated dispensers. STANOLITH Grease is heat and water resistant. It will reduce grease inventories, eliminate waste and prevent costly application errors. Find out more about how STANOLITH Grease can help you do many tough lubrication jobs with just *one grease!* In the Midwest call your nearby Standard Oil lubrication specialist. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Blandin maintenance man, Fred Harwood (left), and I. A. Westerlund, Standard Oil lubrication specialist, inspect a table roll bearing. This is just one of many places in the plant where STANOLITH Grease provides top-efficiency lubrication.

I. A. Westerlund is a graduate of the University of Minnesota with an engineering degree. He is also a graduate of Standard's Sales Engineering School, and makes good use of his training in providing technical service to customers. He's been doing this for 14 years. His customers find this experience and training pay off for them.



STANDARD OIL COMPANY (Indiana)



whatever the operation...

Titeflex Quick-Seal Couplings for fast, leakproof connections!

Everywhere in industrial operations, you find Titeflex Quick-Seal Couplings "making connections"! And what connections! Absolutely leakproof. Couple or uncouple in one second. Allow free flow of any material. Sizes $\frac{1}{4}$ " to 12".

See drawing for typical uses. Then check your own plant for trouble spots where Quick-Seal Couplings can serve you profitably. For details... send coupon.

- | | |
|-------------------------------|----------------------------|
| ① Tank Car Unloading | ⑤ Mobile Testing Equipment |
| ② Furnace Doors | ⑥ Machine Cleaning |
| ③ Blending "Switchboards" | ⑦ Air Lines for Tools |
| ④ Lift Trucks—Hydraulic Lines | |

Titeflex

TITEFLEX, INC. (Industrial Products Div.)
509 Hendee Street, Springfield, Mass.

Send me your free Quick-Seal Couplings Catalog—don't obligate me.

Name _____ Title _____

Firm _____

Address _____

City _____ Zone _____ State _____

Titeflex Quick-Seal Couplings • Leakproof at all operating pressures, in every application

When inquiring check CP 2789 opposite last page

ENGINEERING

True micrometer control in bleeding, metering pressure letdown...

valve makes possible duplication of tests and readings

Uses: Control of bleeding and pressure letdown for vacuum and pressures up to 60,000 psi.

Features: Valve has micrometer stem which permits accurate control for all types of testing through the principle of differential screw threads.

Description: Device makes possible duplication of tests and readings. One complete revolution of

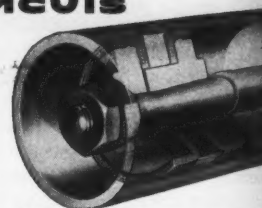


Micrometer stem makes dial setting an easy-to-read record

handle opens valve 0.015" and positive stop at zero prevents damage due to over tightening. Unit is manufactured in variety of materials including stainless steel, Hastalloy, and titanium. Sizes cover complete range of tubing up to $\frac{9}{16}$ ".

(Micro-Valve is manufactured by High Pressure Equipment Company, Inc., Dept. CP, 1222 Linden St., Erie, Pennsylvania... or for more information concerning this manufacturer's product, reader may simply check CP 2790 on Reader Service slip which is located opposite last page.)

KEEP EFFICIENCY HIGH with DARCOVA Pumcups



Pumcup designs include the conventional and 45° bevel types in a full range of sizes for all reciprocating pump and cylinder mechanism requirements.

A LOT of dollars go slipping right past the pistons of reciprocating pumps and cylinders that must be frequently repacked. But Darcovia Pumcups keep pump efficiency up, hold slippage and maintenance down!

Because of Darcovia's unique design, true texture engineering and precision manufacture, Pumcups outlast other packing at least 3 to 1.

Why not judge for yourself? Get all the facts. Send today for informative Bulletin No. 5503.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.



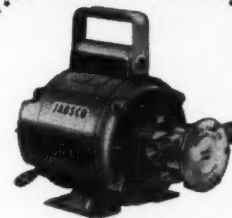
TRADE MARK

Pumcups

When inquiring check CP 2791 opposite last page

cut pumping costs with

JABSCO INDUSTRIAL PUMPS



Model 2187
Portable Pump and Motor
Unit—115 V-A.C.
or 32 V—
110 V-D.C.

- ◀ INSTANTLY SELF-PRIMING
- ◀ SIMPLE, COMPACT, ONLY ONE MOVING PART
- ◀ DURABLE NEOPRENE IMPELLER
- ◀ SELF-LUBRICATED
- ◀ TROUBLE-FREE OPERATION



HERE'S another Jabsco industrial pump—designed and built for chemical, pharmaceutical and other industrial applications. Ideal for transfer of various liquids and acids—sump drainage, coolant pumping, general transfer, pulp in solution, filtering, brines, plating solutions—even fluids containing foreign matter or particles, silt, crystals, and other gritty materials. Bronze, stainless steel or plastic construction is available to solve your specific pumping problems.

Pumps either light or heavy viscous liquids. Temperature ranges from 35° to 180° F. Write for a Jabsco factory recommendation for your own needs. Specify application, fluid pumped, temperature, pressure, etc.

FREE—
send for catalog sheets, detailed information... no obligation, of course!

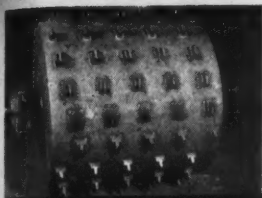
PATENTED
AND
PATENTS
PENDING

JABSCO PUMP COMPANY

2031 Lincoln Street, Burbank, California

When inquiring check CP 2792 opposite last page

CHEMICAL PROCESSING



Only a few minutes
to replace teeth
in this bale breaker



BALE BREAKER TEETH ARE SUBJECT TO EXTREMELY HARD WEAR.

In the past, the teeth were welded directly to the cylinder; consequently, when they wore out, the teeth had to be burned off and new teeth welded on. In most cases, this creates an undesirable fire hazard.

But not with this New Taylor-Stiles cylinder. Teeth, when worn, can be removed individually and replaced with new teeth.

This is because only the tooth sockets not the teeth, are welded to the cylinder. The teeth are driven into the mountings and when worn, are driven out and replaced with new teeth.

The teeth always remain firmly in the mountings, since the direction of cylinder revolution tightens the teeth in the tapered sockets.

This is just one of the many unusual features of Taylor-Stiles Long Fiber and Short Fiber Bale Breakers.

For complete details of these machines, write for illustrated brochures today.

TAYLOR-STILES
Company
CUTTING MACHINES & KNIVES

20 Bridge Street Riegelsville, N. J.

When inquiring check CP 2793
opposite last page

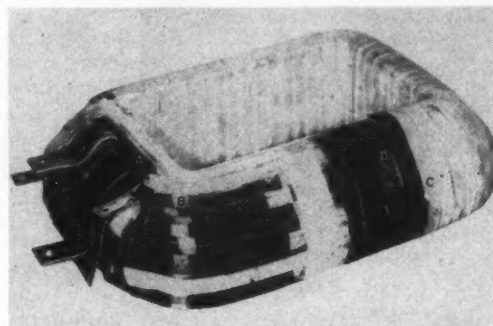
ENGINEERING & MAINTENANCE

Develops advanced insulation for direct current armored motors . . .

Class H insulation applied to coils of DC motors
in regular production

Improved line of DC armored motors with insulation utilizing Class H materials applied to the coils is now in regular production. Insulation withstands temp of 180°C. In normal duty it virtually eliminates insulation failure as the limiting factor in continuous armored motor service.

Insulation system includes application of special developed silicone varnish, and did not lose dielectric



Insulation on motors withstands temperatures of 180°C.

or physical strength from operating under extreme conditions. Insulation was found to outlast Class B insulation by as much as 32:1.

Insulation is used on field coils, armature coils, and main area of armature insulation. Silicone-treated mica mat is used on commutating and exciting field coils and on armature coils. All present Class H insulated coils may be interchanged with Class B coils in older motors of line.

(DC armored motors are products of Direct Current Motor and Generator Dept., General Electric Co., Dept. CP, Erie, Pa. . . or for more information check CP 2794 on form opposite last page.)

Flexible hose for fumes and dust control

Four bulletins cover design, installation, and other information on flexible hose used in dust and fume control as well as in air conditioning and material handling installations. Friction loss and other useful data are presented.

Buls 41, 42, 43, and 44 are issued by The Flexaust Company, Div. of Callahan Zinc-Lead Co., Inc., Dept. CP, 100 Park Ave., New York 17, N.Y. When inquiring specify CP 2795 on form opposite last page.



versatile, durable **Titeflex** metal hose . . . for every type of processing operation

Can take grueling punishment from corrosive fluids, high temperatures, excessive vibration and pressures . . . or from any combination of these industrial *spoilers*. All-metal construction. Wide range of sizes. Braided or unbraided. Choice of alloys and fittings to meet *every* need.

Titeflex Metal Hose finds many important jobs *everywhere*. Investigate your processing operations now and see where Titeflex Flexible Metal Hose can work for you. Send in coupon for important additional information *today*.

- | | |
|--------------------------|---|
| ① Fire Extinguisher | ⑤ Milling Machine |
| ② Air Control Lines | ⑥ Hydraulic Press—
Lubricating Lines |
| ③ Cleaning Vats | ⑦ Steam Lines |
| ④ Air Conditioning Units | |

Titeflex

TITIFLEX, INC. (Industrial Products Div.)
509 Hendee Street, Springfield, Mass.

Send me your free Titeflex Flexible Hose Catalog without obligating me.

Name _____ Title _____
Firm _____
Address _____
City _____ Zone _____ State _____

TITIFLEX FLEXIBLE METAL HOSE ticks

corrosion
temperature
vibration
pressure

in all industrial
operations

When inquiring check CP 2796 opposite last page

new literature

Industrial bulletins pertinent to the reader . . .
offering data on products, processes, services

Methyl parathion insecticide

Methyl parathion, an organic phosphate insecticide recommended for control of aphids and spider mites on cotton, is covered in detail in four-page technical bulletin. Sections are devoted to general utility, registrations, residue tolerance, use on cotton, handling precautions, toxicity information, shipping information, and formulating notes.

Bul O-55 is issued by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 800 N. Twelfth Blvd., St. Louis 1, Mo. When inquiring reader may simply specify CP 2797 on convenient Reader Service slip which is located opposite last page.

Studies physical-chemical properties of ethane-nitrogen mixtures

Data on liquid-vapor phase equilibria, gas phase pressure-volume-temperature relationships, and saturated liquid and vapor densities of the ethane-nitrogen system are presented in 44-page study. Tabular and graphical data are given, along with experimental procedures. There are 25 references.

Research Bulletin 26 may be obtained by remitting \$5.00 direct to Institute of Gas Technology, Dept. CP, 17 W. 34th St., Technology Center, Chicago 16, Ill.

Explains reactions, characteristics of molybdenum catalysts

Reactions which may be advantageously catalyzed by molybdenum compounds, as well as commercial processes now being used, are reviewed in 24-page booklet. Commercial reactions include oxidation, hydrogenation, dehydrogenation, isomerization, cyclization, chlorination, and condensation. Research reactions considered are dehy-

dratation, polymerization, and alkylation. A tabulation of typical reactions and conditions including starting material, catalyst, temperature, and conditions particular to a process, is included.

A special section is devoted to factors to be considered in choosing a specific catalyst. Factors include: oxidation state; supports for the catalyst; promoters; and methods of manufacture. A list of 25 references is given.

"Molybdenum Catalyst for Industrial Processes" is available from Dept. L., Climax Molybdenum Company, Dept. CP, 500 Fifth Ave., New York 36, N.Y. Specify CP 2798 opposite last page.

Chemical resistance chart for plastic linings

Two-page chart shows the resistance of three different types of plastic linings to a wide variety of chemicals. Recommended maximum temperatures for each are given.

Data Sheet #82 is issued by Quelcor, Inc., Dept. CP, Front & Broomall Sts., Chester, Pa. When inquiring specify CP 2799 opposite last page.



"That's a great sales campaign, A. J. . . now we'll put the chemists to work developing the product."

Consistent volumetric accuracy of pump detailed

Two-page, two-color pamphlet lists typical applications, advantages, and presents a capacity table for proportioning pump. Consistent volumetric accuracy of unit is explained in design detail.

Bul 1105-2 is issued by Proportioners, Inc., a div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R. I. When inquiring specify CP 2800 on form opposite last page.

Shows operational principle for mass spectrometer

Twelve-page catalog in two colors describes laboratory and process instrument based on mass spectrometer principle. Simplified explanation of principle is outlined with a diagram. Instruments described include analytical mass spectrometer, leak detector, isotope-ratio mass spectrometer, dual-purpose mass spectrometer, micro-manometer, process-monitor mass spectrometer. Suggested installations include petroleum, petro-chemical, processing applications.

Bul CEC 1302B is issued by Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 15, Calif. When inquiring specify CP 2801 on form opposite last page.

Depicts valve characteristics by service

Three bulletins cover manual and foot operated air valves for water, oil, and air service. Flow patterns, overall dimensions, and valve characteristics are included. Air valves are rated from 0 to 4000 psi, water valves from 0 to 6000 psi, and oil valves from 0 to 6000 psi.

Bul A-5, W-5, and O-5 are issued by Barksdale Valves, Dept. CP, 5125 Alcoa Ave., Los Angeles 58, Calif. When inquiring specify CP 2802 on form opposite last page.

Detailed technical description of activated alumina

Detailed technical description, advantages, and an examination of typical applications of activated alumina are presented in two-page, two-color data sheet. Complete chemical specifications and government specifications are also included. Among applications suggested are drying of gases, liquids, and removal of fluorine from liquid systems.

Form C4-5-755 is issued by Reynolds Metals Co., Dept. CP, 2500 S. Third St., Louisville 1, Ky. Specify CP 2803 opposite last page.

Molybdenum disulfide lubricants

Seventeen types of Molykote MoS₂ lubricants are described in four-page technical bulletin. Performance under extreme bearing pressure, and high, low, and normal temperature lubrication applications are covered. A chart describes the types and gives the kind of carrier used in it, temperature range for best operating, and proper method of application.

Bul 103A is issued by The Alpha Molykote Corp., Dept. CP, 65 Harvard Ave., Stamford, Conn. Specify CP 2804 opposite last page.

Economies of pelletized blacks in paint making are given

Economies of pelletized carbon blacks for pigmentation of quality paints, lacquers, and enamels are given in four-page folder. The blacks are free-flowing, easy to handle, and clean to work. A lampblack substitute for tinting, called Sterling, is also described.

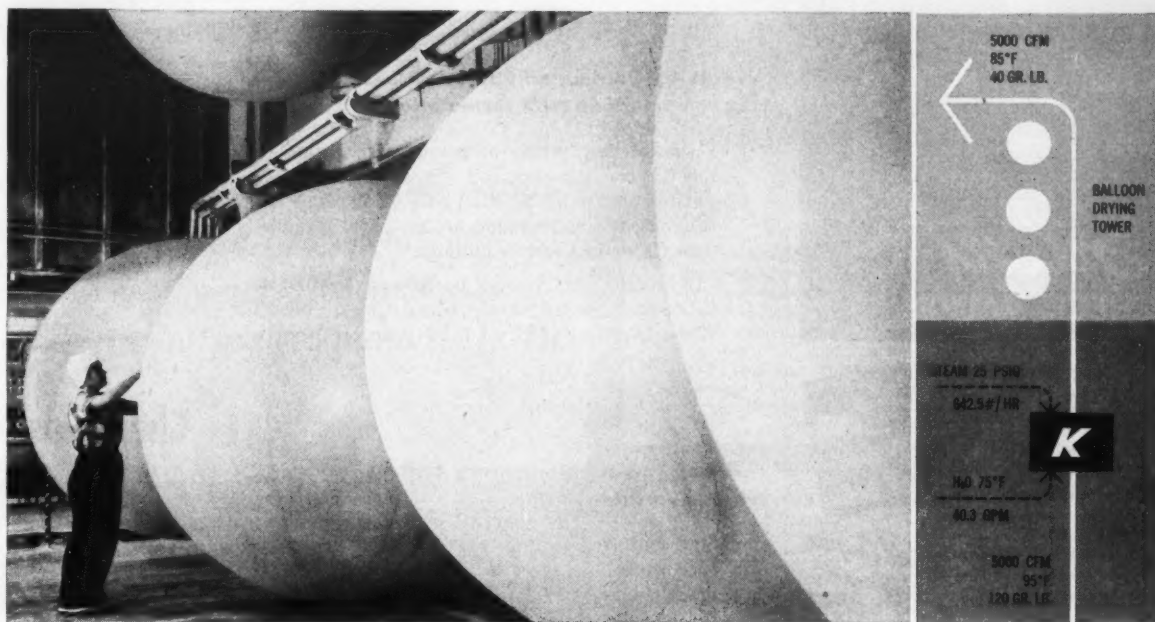
"Black Pearls and Sterling" is issued by Special Blacks Div., Godfrey L. Cabot, Inc., Dept. CP, 77 Franklin St., Boston 10, Mass. When inquiring specify CP 2805 on form opposite last page.

Air-operated machine tools illustrated in color

Illustrations and descriptions of drill press feeds, vises, hydro-checks, rotary feeds, and other air-operated devices are given in eight-page booklet. Many installations are shown in full color. Air motor drive for units is detailed.

Bul ML-3 is available from Bellows Company, Dept. CP, 222 W. Market St., Akron, Ohio. Specify CP 2806 opposite last page.

Dry air saves balloon-maker \$2500/yr.



Low-temperature dry air saves the Dewey and Almy Chemical Company \$2500 or more a year in operating costs. Kathabar humidity conditioning delivers this air for drying weather balloons (see flow diagram) using only 75°F city water and low pressure steam. Dewpoint of the air is reduced from 72.5°F to 43°F without refrigeration!

Compared with standard refrigeration for the same operation, the Kathabar system saves 81¢ an hour in water, steam, and electricity requirements—operating savings of over \$6 per 8-hour day! In addition, the first cost of Kathabar equipment is lower, operation and maintenance are simpler.

If your operations require low-temperature drying, it will pay you to investigate the many economies of Kathabar humidity conditioning.

write for the complete Dewey & Almy story today



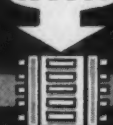
SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

When inquiring check CP 2807 opposite last page

Quiet your piping system!

(Silent Service Since 1929)

WITH



WILLIAMS-HAGER
FLANGED

Silent
CHECK VALVES

Yes . . . you can quiet your piping system and end costly water hammer in your plant with Williams-Hager Check Valves. Available in standard pipe sizes from 1" to 20", they can be installed without special tools. Send for Bulletin 654 which contains complete details.



*Mail Coupon
Today*

THE WILLIAMS GAUGE CO., INC.
146 Stanwix St., 2 Gateway Center
Pittsburgh 22, Pa.

Please send me a copy of Bulletin 654 on Williams-Hager Flanged Silent Check Valves.

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COMPANY _____
ADDRESS _____
CITY _____ STATE _____
ZONE _____

THE WILLIAMS GAUGE CO., INC.
2 Gateway Center • Pittsburgh 22, Pa.

When inquiring check CP 2808
opposite last page

NEW LITERATURE

Details on vertical pumps

Construction details of vertical turbine pumps are presented in large cut-away views included in eight-page bulletin. Features of the units are clearly explained in this way. Pumps described are suitable for a variety of industrial applications: for supplying water from wells, lakes, and rivers; for sump, condenser, line and booster pumping; and for circulating and dewatering.

Bul 1015 is issued by Johnston Pump Co., Div. of Emsco Mfg. Co., Dept. CP, 3272 E. Foothill Blvd., Pasadena 8, Calif. When inquiring specify CP 2809 on form opposite last page.

Technical data on alkyds, varnishes are given along with formulations

Technical descriptions of manufacturer's line of alkyds and varnishes are detailed in 74-page spiral-bound technical data book. Following the description of each product are suggested formulations for various surface coatings.

"Technical Data" is issued by Farnow, Inc., Dept. CP, 4-80 47th Rd., Long Island City 1, N. Y. When inquiring specify CP 2810 on form opposite last page.

Shows how supplementary control holds variable in line

Supplementary control device which anticipates fuel needs of controlled heating equipment is described in two-color bulletin. Schematic drawing in bulletin shows how this device is wired in between heat load and off-on controller to achieve straight line temperature control.

Bul F-5795-2 is issued by Wheelco Instruments Div., Barber-Colman Co., Dept. CP, 1300 Rock St., Rockford, Ill. When inquiring specify CP 2811 on form opposite last page.

Dispersers are adaptable to many materials

Disperser designed for rapid, efficient dispersion of solids in liquids; liquids in liquids; and gases in liquids; is described in four-page folder. Unit makes use of severe hydraulic shear to obtain dispersion. Folder includes photographs and drawing of unit.

Bul "The Lancaster Disperser" is issued by Lancaster Chemical Corporation, Dept. CP, Broad & 13th Street, Carlstadt, N. J. When inquiring specify CP 2812 on form opposite last page.



*Seasons
Greetings*

We take time out to
express our thanks
and good wishes to all

MERRY
CHRISTMAS
and a
HAPPY
NEW
YEAR

CATAWISSA VALVE & FITTINGS CO.

CATAWISSA • PENNSYLVANIA

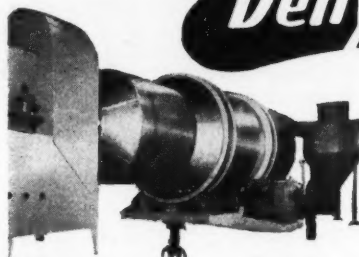
When inquiring check CP 2813 opposite last page

Chemicals are Dried Quickly, Economically

in . . .

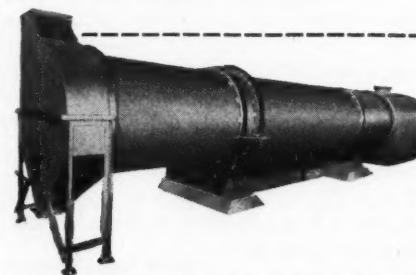
DehydrO-Mat

PAT. PENDING



Steam-heated DEHYDRO-MAT

Low temperature, variable-inclination, rubber-tired DehydrO-Mat dries ammonium nitrate and other hard-to-dry chemicals requiring hours of hold-up time.



CONVENTIONAL DRYER

Heavy-duty rotary unit with furnace, burner, breeching and air-handling system. Used for ammoniated granular fertilizers and other chemicals.



Literature and information on request.

When inquiring check CP 2814 opposite last page

CHEMICAL PROCESSING

All about tanks & drums made of polyethylene

Collection of data sheets provides complete information about polyethylene tanks and drums with capacities of 55, 30, 15, and 5 gallons. Collection contains general information on properties and comparative performance of polyethylene and conventional containers. Specific mechanical properties of polyethylene are reviewed and special features of each size of container are described.

Several large tanks and custom fabricated containers are pictured. Their specifications are also given.

"Molded Polyethylene Containers" is issued by Delaware Barrel & Drum Co., Inc., Dept. CP, P. O. Box 1648, Wilmington, Del. When inquiring specify CP 2815 on form which is located opposite last page.

Folder cites features, advantages of diammonium phosphate process

Continuous process for making diammonium phosphate is described in four-page folder. Product obtained is crystalline, free flowing, having a nominal analysis of 18-46-0. Advantages of process over conventional processes are cited. Provision can be made for drying impurities separately, permitting nominal analysis to be increased to 20-47-0. Complete flow diagram is included.

Folder "Diammonium Phosphate" is issued by John J. Harte Company, Dept. CP, 284 Techwood Drive, N. W., Atlanta, Georgia. When inquiring specify CP 2816 on form which is located opposite last page.

Properties of four acrylic esters discussed in bulletin

Methods of polymerization, applications of polymers and copolymers, physical and chemical properties, shipping data, and reactions of, ethyl acrylate, n-butyl acrylate, 2-ethylbutyl acrylate, and 2-ethylhexyl acrylate, are described in eight-page technical bulletin. Polymerization procedures and useful chemical synthesis reactions are included. Precautions and safe handling, and twenty-two selected references to acrylic esters in technical literature are also given.

Bul F-7434 is issued by Carbide and Carbon Chemicals Co., Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 2817 on form opposite last page.

How Dowicide Preservatives solved bacteria problem for paint industry

Added to water-based latex paints, Dowicide Preservatives prevent bacteria breakdown of protein and extend paint shelf life



THE DOW CHEMICAL COMPANY
Dept. DO 727C-1, Midland, Michigan

Please send me detailed information on the uses of Dowicide Preservatives.

Name _____

Title _____

Company _____

Address _____

City _____ State _____



DOWICIDE PRESERVATIVES made this difference. Latex paint control sample (left) was exposed for 20 days at room temperature (70°-75°F.). Bacteria attack caused the paint to "separate out"—and bad odors to develop. The protein lost its suspending powers and the pigment settled out. Test sample with Dowicide Preservatives added (right) was exposed to the identical conditions. Damaging bacterial action was prevented—protein was not degraded, pigment stayed in suspension.

Dealers' investment is protected during long periods of paint storage. Dowicide Preservatives maintain the easy-to-prepare and easy-to-mix characteristics that make latex paints so popular with the increasing "do-it-yourself" market.

Industry generally is increasing manufacturing efficiency and improving product quality by using Dowicide® Preservatives. Fourteen different Dowicide Preservatives currently bring appreciable, specific benefits to the paint, paper and pulp, petroleum, leather, textile, adhesives, farming and other industries. Full information on profitable use of these versatile Dowicide Preservatives in your processing or selling operations can be quickly had by writing THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on **DOW CHEMICALS**

DOW

When inquiring check CP 2818 opposite last page

TRACIT



THERMAL CONDUCTING CEMENTS SAVE 75% OVER JACKETING

TRACIT is a thermal conducting cement that eliminates jacketing on pipes, valves and pumps. It is applied over steam and electrical tracings wherever it is desirable to maintain temperatures by the addition or subtraction of heat within the range of minus 115 to 800° F. TRACIT is equally effective on systems that are alternately heated and cooled.



TRACIT-200 applied with caulking gun

TRACIT-200 is a special thermal conducting cement applied with caulking gun. The excellent thermal conductivity, ease of handling and application, thermal shock resistance and low cost make TRACIT-200 ideal for traced pipe and tanks.

Reduce costs on valve, piping and pumping installations. Write for descriptive bulletin today.

CHEMAX MANUFACTURING CO.
NEW CASTLE, DELAWARE

When inquiring check CP 2819 opposite last page

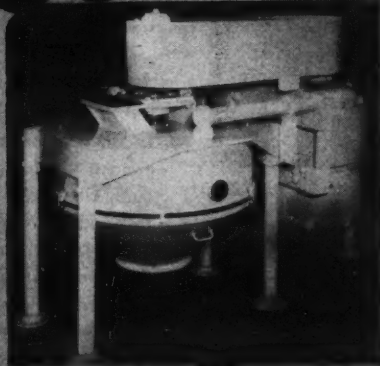
PARTICLE SIZE REDUCTION!

High Productivity Rates per HP expended...

Narrow Particle Size Range...

Minimum Product Heating...

Capacity...up to 10,000 pounds per hour or higher on friable materials.



Belt Drive "ENTOLETER" Impact Mill equipped with 25 HP motor.

We shall be glad to process samples of your product on the "ENTOLETER" Impact Mill in our laboratory.

The trademark "ENTOLETER" is your guarantee of complete satisfaction.

ENTOLETER DIVISION
The Safety Car Heating and Lighting Company, Inc.

1183 Dixwell Ave.—New Haven 4, Conn.

When inquiring check CP 2820 opposite last page

NEW LITERATURE

Describes instruments for lab standards

Instruments for laboratory standards and standard cells are illustrated in eight-page bulletin. Descriptions include AC and DC voltmeters, AC and DC ammeters, wattmeters, portable precision shunts, standard cells. Booklet also includes information on frequency coverage, frequency compensation, and wave form effect of manufacturer's Model 326 voltmeters, ammeters, and wattmeters.

Cat A-46-A is issued by Weston Electrical Instrument Corp., Dept. CP, 614 Frelinghuysen Ave., Newark 5, N. J. Specify CP 2821 opposite last page.

Data sheet released on infrared film

Six-page data sheet on manufacturer's infrared film includes information on processing and exposure indices. Film is described as being sensitive through the visible spectrum and into the infrared to approximately 9000 Å with maximum sensitivity in region from 7700 Å to 8400 Å. Sensitometric data are also included.

Pamphlet No. M-9 is issued by Sales Service Div., Eastman Kodak Co., Dept. CP, 343 State St., Rochester 4, N. Y. When inquiring specify CP 2822 opposite last page.

How zinc paint protects steel

Metal protective paint containing 100% zinc dust and possessing rust inhibitive properties is covered in 12-page pocket-size publication.

Publication "Horse Head Bulletin," Sept. 1955, is issued by The New Jersey Zinc Co., Dept. CP, 160 Front St., New York 7, N.Y. When inquiring specify CP 2823 opposite last page.

Stop piping corrosion!

This new booklet gives facts on
**TUBE TURNS
PLASTICS
PVC
fittings**



You can solve corrosion problems with unplasticized PVC piping—outlasts and costs far less than metal systems for handling many types of corrosive materials. New booklet gives properties and applications of PVC systems, describes PVC pipe fittings and flanges made by Tube Turns Plastics, Inc., the only source for injection molded PVC products. Produced by the exclusive Hendry process, these PVC fittings are considerably stronger than fittings made by conventional processes. Write Tube Turns Plastics, Inc., Dept. PA-12, 2929 Magazine Street, Louisville 11, Kentucky.



TUBE TURNS PLASTICS, INC.

Louisville 11, Kentucky

Call your TUBE TURNS PLASTICS' Distributor

When inquiring check CP 2824 opposite last page

Announcing...

MOLYKOTE MICROSIZE

The "finest" molybdenum disulfide lubricant available.

With average particle sizes of less than one micron, MOLYKOTE MICROSIZE has the physical ability to enter the smallest spaces between mating parts to fully exploit the basic lubricating features of MoS₂ at extreme bearing pressures and temperatures. Economically, too, the covering ability of MOLYKOTE MICROSIZE is far superior to ordinary grades of molybdenum disulfide powder.

"Information on MOLYKOTE appears in Sweet's Product Design File, 1955, Section C."

For more detailed information, write today for our Bulletin 104.



THE ALPHA CORPORATION

65 Harvard Ave. • Stamford, Conn.

When inquiring check CP 2825 opposite last page

CHEMICAL PROCESSING

Self-draining sampling valve illustrated in bulletin

Valve, which has the stem seating on the outside of the valve body, making it completely self-draining, is described and illustrated in two-page bulletin. Recommended pressures and materials of construction available are included.

Bul 270 is issued by Jerguson Gage & Valve Co., Dept. CP, 87 Fellsway, Somerville 45, Mass. When inquiring specify CP 2826 on form opposite last page.

Two-stage pumps handle 300 gpm at 300-550 ft heads

Six-page bulletin describes two-stage pumps in capacities to 300 gpm at heads from 300 to 550 ft at temperatures up to 250°F. Units described are suitable for boiler feed, humidifier, air conditioning, high head building, and other applications.

Bul 52B6105C is issued by Allis-Chalmers Manufacturing Co., Dept. CP, 1151 S. 70th St., Milwaukee, Wis. When inquiring specify CP 2827 on form opposite last page.

Information on installations of worm gear drives

Illustrations and information on typical installations of worm gear speed reducers are presented in eight-page publication. Ten specific benefits that can be obtained with these units are also covered.

Publication on worm gear installations is issued by The Cleveland Worm & Gear Company, Dept. CP, 3249-59 East Eightieth St., Cleveland 4, Ohio. When inquiring specify CP 2828 on form opposite last page.

Explains safety feature of low-temp cabinet

Low-temperature cabinet described in this two-color bulletin is equipped with ceramic-covered heaters, non-arcing, brushless blower motor, and has switches and relays mounted outside the cabinet for safety protection. Construction is explained. Size and specifications are also given together with pictures of the unit.

Bul 339 is issued by Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. When inquiring specify CP 2829 on form opposite last page.

Welding Copper



Inert gas shielded metal arc welding of new copper shell for rebuilt tower.

SAVES 38% in materials and labor for joining

Some time ago, the Tennessee Eastman Company, Kingsport, Tennessee, a Revere customer, began to rebuild some of its copper stills or fractioning towers, which previously would have been silver-brazed. Revere's welding specialists were called in to see whether or not welding would be superior. Demonstrations were made to Tennessee Eastman engineers and shop personnel, with the result that welding was adopted. Actual experience in the shop shows a saving of 38% in materials and labor for joining, and a better job in every way. The welding method used is the inert gas shielded metal arc process.

Reconstruction of the towers was made to reduce the number of flanges. At the same time Tennessee Eastman changed from the flange joint tray construction to the inserted tray type and incidentally, reduced the number of gaskets with their accompanying maintenance problems. The trays are salvaged by shearing off the bolt hole circle and folding up the edges. The towers are some 45' high, 6' to 10' in diameter, with a tray or bubble cap plate at

specified intervals. Tennessee Eastman plans to rebuild several towers a year in this economical way.

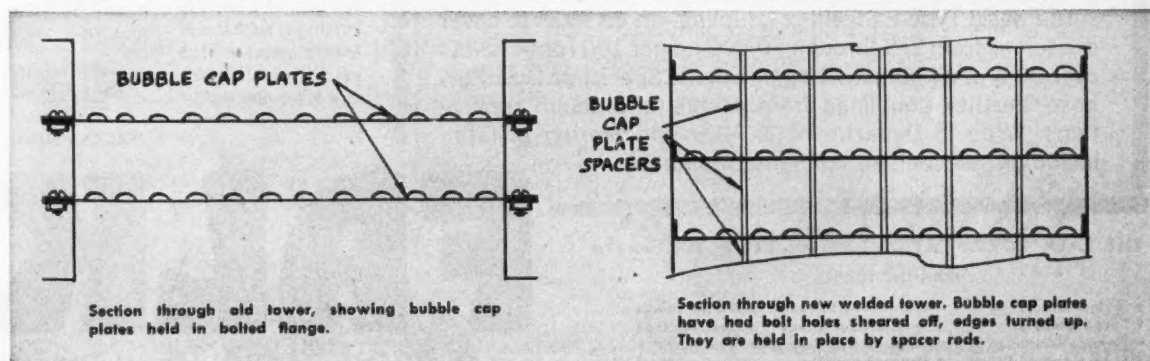
It will pay you as it did Tennessee Eastman to look into welding as a modern method of joining copper. Remember Revere is fully experienced in the most modern and efficient methods, and will collaborate with you on their application.

REVERE

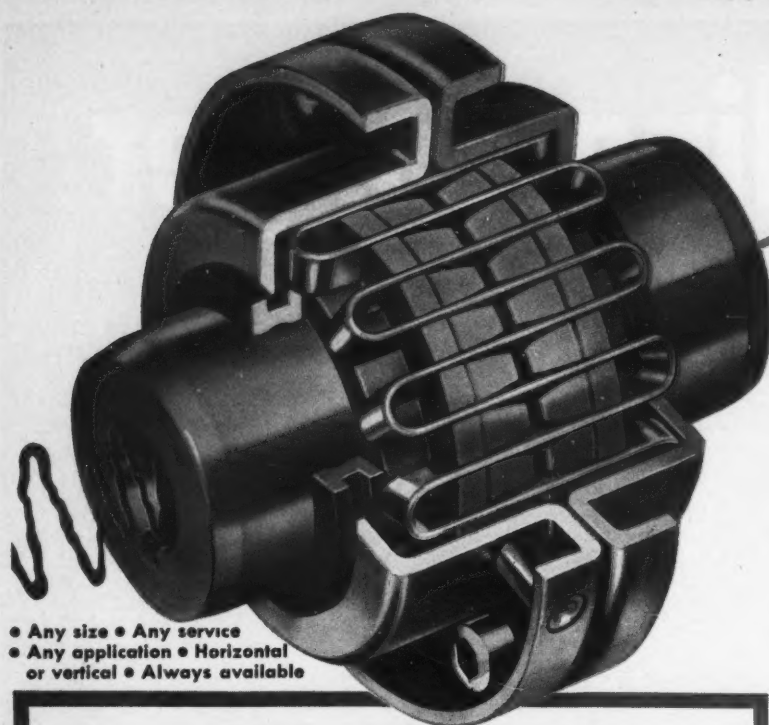
COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.;
Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.
Sales Offices in Principal Cities, Distributors Everywhere.



When inquiring check CP 2830 opposite last page



- Any size • Any service
- Any application • Horizontal or vertical • Always available

Why FALK Steelflex Couplings give the *finest* protection for connected machinery

Maximum protection of connected machinery is best provided by Falk Steelflex Couplings because, thanks to their exclusive design, they overcome the damaging conditions of shock loads, shaft misalignment and vibration. How this unique multiple protection is made possible is shown at the right.

Falk Steelflex Couplings give the most economical protection, too, because they make connected machinery last longer and give better service. Furthermore, when actual coupling costs are figured per year of service, Falk Steelflex Couplings show substantial savings through their rugged all-steel construction, easy interchangeability and low maintenance requirements.

The basic Type F Steelflex Coupling—in 33 sizes to cover capacities from 2/5 through 70,000 hp per 100 rpm—meets over 90% of all industrial applications. Special or Dual Purpose Steelflex Couplings are available for problem applications. Write to Department 247 for engineering bulletin, including selection and dimension details.

THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- | | | |
|------------------------|------------------------|----------------------|
| • Motorreducers | • High Speed Drives | • Marine Drives |
| • Speed Reducers | • Special Gear Drives | • Steel Castings |
| • Flexible Couplings | • Single Helical Gears | • Weldments |
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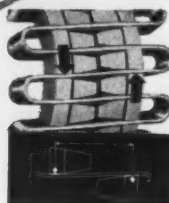
FALK

...a good name in industry

When inquiring check CP 2831 opposite last page

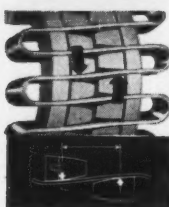
Exclusive FALK Steelflex grid-groove design smothers shock and vibration.

The damaging effects of shock and vibration can shorten the life of any connected machinery. Here is how the Steelflex grid-groove design overcomes these common enemies.



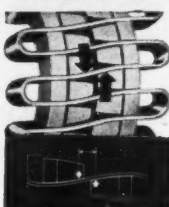
Under LIGHT LOADS

The gridmember bears only at outer edges of grooves. The long span between points of contact remains free to flex under load variations.



Under NORMAL LOADS

As load increases, the distance between supports on the grooves is shortened proportionately, but a free span remains to cushion shock loads.

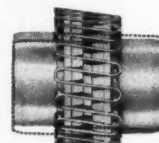


Under SHOCK LOADS

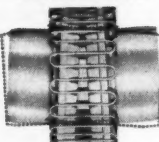
Under extreme overloads, the grid-member bears fully on the grooves and transmits full load directly. The coupling remains flexible, within its rated capacity.

...Accommodates shaft misalignment and free end float

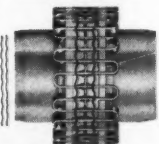
Basic maintenance procedure dictates regular inspection and correction of shaft alignment. Between inspections, Steelflex couplings provide protection by accommodating unavoidable shaft misalignment and end float. The gridmember which connects the two hubs of a Steelflex coupling is not fastened to either hub, so each hub can shift without imposing load on the other shaft.



PARALLEL MISALIGNMENT



ANGULAR MISALIGNMENT



FREE END FLOAT

NEW LITERATURE

Valve for bulk material handling described

Bulk material valves designed for bins, hoppers, conveyors, and downspout applications are subject of four-page bulletin. Details of the valves are given in pictures, specifications. Details of applications handling fine and dusty materials are explained.

Bul 105 is issued by Stock Equipment Co., Dept. CP, Hanna Bldg., Cleveland 15, Ohio. Check CP 2832 on form opposite last page.

Gives features of vertical turbine pumps

Condensed selection table — a valuable guide to horsepower, head, and capacity — is presented in eight-page folder on vertical turbine pumps. Sectional illustrations with enlarged views of special features clearly describe the units. Detailed drawings of pumping and distribution systems are also included.

Bul 100 is issued by Layne & Bowler Pump Co., Dept. CP, 2943 Vail Ave., Los Angeles 22, Calif. Specify CP 2833 on form opposite last page.

Catalogs physical characteristics of high-alloy castings

Physical characteristics and uses of wear-resistant, high-alloy castings are detailed in four-page, two-color bulletin. A listing is given of production facilities available for castings made of these metals and commercial grades of stainless and high-temperature alloys.

"High Alloy Castings" is issued by Coast Metals, Inc., Dept. CP, Little Ferry, N.J. When inquiring specify CP 2834 on form opposite last page.

KOH — its manufacture, handling and use

Manufacture and use of caustic potash are given in 18-page, two-color brochure. Complete technical data including specific gravity and density tables of solutions as well as temperature and alkali conversion tables are included. Also given are detailed procedures for unloading and precautions for handling.

"KOH" is issued by Columbia-Southern Chemical Corporation, Sub. of Pittsburgh Plate Glass Co., Dept. CP, 632 Fort Duquesne Blvd., Pittsburgh, Pa. When inquiring specify CP 2835 on form opposite last page.

**Color, sound film
about drying**

Drying in general, with emphasis on design, operation, and uses of vertical Turbo-Dryers is explained in 12-minute, 16 mm sound color movie. Particular emphasis is placed on method of drying heat- or oxygen-sensitive materials. Film is available to engineering groups, societies, private companies, and universities.

Film "The Operation and Application of Turbo-Dryers" is available from Wyssmont Company, Inc., Dept. CP, 42-05 27th St., Long Island City, New York.

**Catalog covers full line
of mixers**

Full line of mixers is pictured and described in eight-page, two-color catalog. Included are spiral ribbon, double-arm, planetary-action vertical, and overlapping-arm mixers. Photographs, charts, and drawings are included.

Bul 55782 is issued by Read Standard Corp., Dept. CP, Bakery-Chemical Division, York, Pa. When inquiring reader may simply specify CP 2836 on Reader Service slip which is located opposite last page.

**Bulletin depicts design, operation
of wire-mesh demisters**

Four-page illustrated bulletin describes construction of wire-mesh demisters and tells why their efficiency is usually in excess of 99.9%. Two-color line drawing shows how entrained liquids are removed.

Bul 17 is issued by Otto H. York Company, Inc., Dept. CP, 6 Central Avenue, West Orange, N.J. When inquiring specify CP 2837 on form opposite last page.

Blue color for vinyls

Single-page bulletin describes heat-stable phthalocyanine blue which combines those properties of the red and green shade variations of phthalocyanine blue which are advantageous in vinyl compounding. Properties and compounding data are briefly covered.

Bul No. 150 is issued by Claremont Pigment Dispersion Corp., Dept. CP, 110 Wallabout St., Brooklyn 11, N.Y. When inquiring reader may check CP 2838 on form which is located opposite last page.

**THE UNIQUENESS OF
DIATOMITE FILTERAIDS**

Paul W. Leppla, Technical Director

The purpose of a filteraid is to sieve out suspended solids without plugging. Therefore, it follows that the porosity of the filter cake is an important characteristic. This is one of the several properties possessed by filteraids produced from diatomite (diatomaceous earth or DE) to a remarkable degree. Actually, diatomite filteraids form filter cakes consisting largely of space, since 85-90% of the volume of the cake is void space and unlike filteraids produced from cellular materials, almost all of the void space is available or useful.

Fine powders of siliceous materials often pack into a bed in such a fashion that the percentage of voids is close to 25%. Thus, 100 pounds of silica in the form of sand occupies about one cubic foot and provides 0.25 cubic foot void space.

In contrast, 100 pounds of processed diatomite filteraid develops over five cubic feet of filter cake, and provides about 4.5 cubic feet of void space for filterable solids. Diatomite filteraids thus offer 18 times the solids retention capacity of an equal weight of sand.

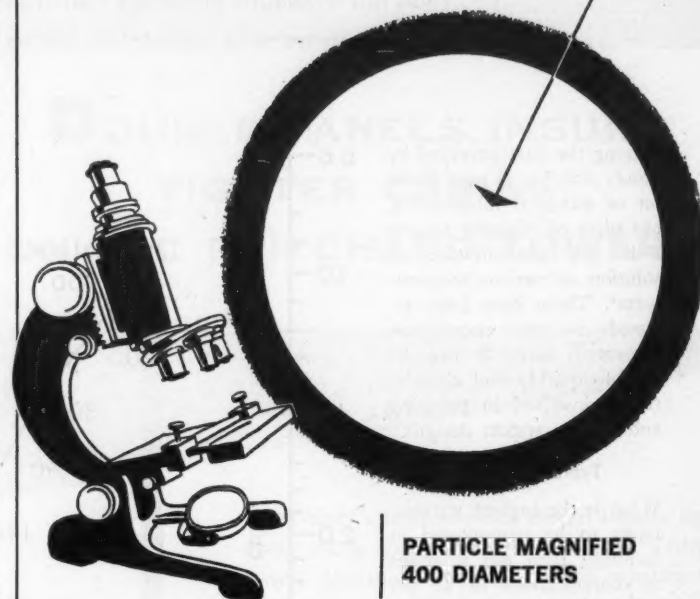
Let's calculate the theoretical filtration capacity of the two materials, using the assumption that filtration will proceed until the voids are completely plugged. Actually, this ideal case is never achieved, but the comparison between the two materials will still be valid.

If the liquid to be filtered contains 1% suspended solids by volume, the sand bed will filter 188 gallons before the void space is completely filled. The same weight of diatomite filteraid will filter 3,400 gallons on the same basis.

As a first approximation, or filteraid rule-of-thumb, the filtration engineer, lacking actual test data, will recommend the addition of diatomite filteraid at the same percentage as that of the suspended matter to be removed. On this basis, it is seen that the hypothetical liquor containing 1% matter as described above should require 1% filteraid. Our calculation shows 100 lbs. diatomite to 3,400 gallons of filtrate, or 0.37%. In plant practice, filteraid dosage often is well below the rule-of-thumb recommendation. This provides convincing evidence for the statement that nearly all the void volume in diatomite filter-cakes is available or useful.

From time to time in the past, materials other than diatomite have been introduced as filteraids, often on the mistaken basis that low bulk density is the principal property required for success. The list of materials upon which ambitious plans have been made and have failed is long. A few filteraid adjuncts having special properties find limited utility in the process industries, but diatomite continues to be the outstanding raw material for filteraid manufacture.

Dicalite Filteraids can filter out particles this small!

PARTICLE MAGNIFIED
400 DIAMETERS

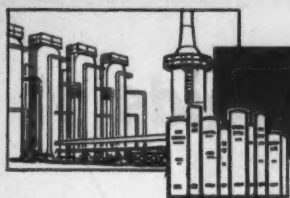
That's right—you can't see it, even when magnified 400 times. The eye can detect, at 10" distance, a particle 80 microns in size; hence, we're talking about particles smaller than .2 micron, down below the wave-length of visible light.

And Dicalite Filteraids are trapping and filtering out smaller particles than that, particles as small as .137 micron, particles visible only with the ultra-microscope or the electron microscope. Which explains why Dicalite Filteraids are so widely used in so many processes where thorough separation is imperative for purity and clarity. Write for further information.



DICALITE DIVISION • GREAT LAKES CARBON CORPORATION, 612 SOUTH FLOWER STREET, LOS ANGELES 17, CALIFORNIA

When inquiring check CP 2839 opposite last page



Viscosity of Soda Ash Solutions

Data from WYANDOTTE CHEMICALS CORPORATION's "Soda Ash"

Nomograph by BRUCE FADER, Associate Editor

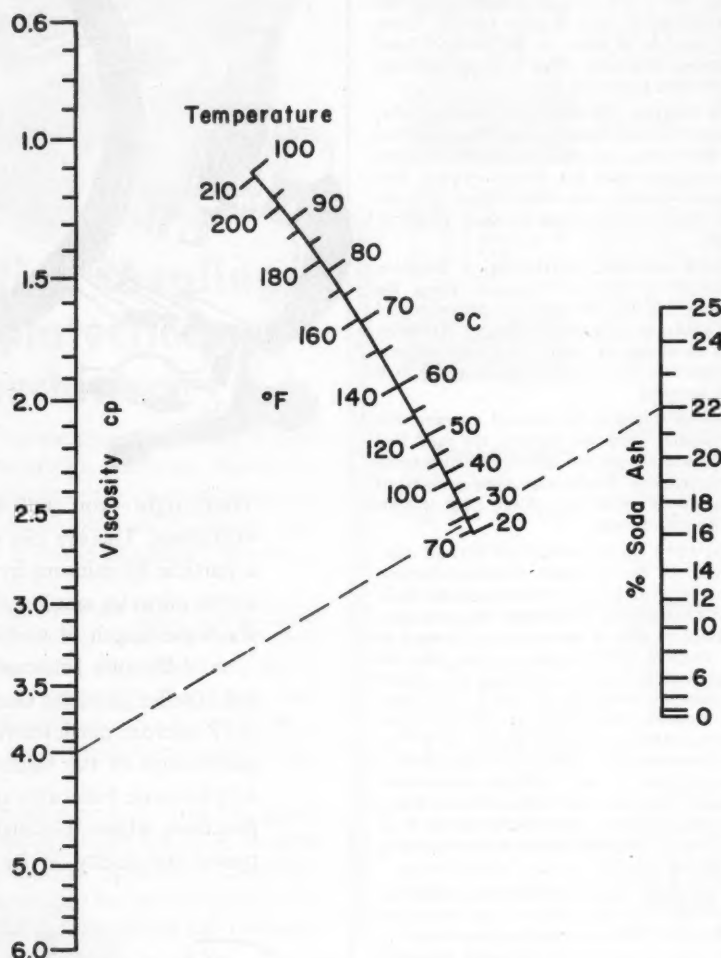
Among the data purveyed by "Soda Ash," a 95-page booklet of technical information, are plots of viscosity against soda ash concentration in solution at various temperatures¹. These have been reduced to the nomograph presented here. It can be used to quickly find viscosity ranges involved in pumping and piping system designs.

Typical Example

What is the highest viscosity likely to be encountered in handling soda ash solutions at concentrations to 22 per cent and temperatures as low as 76°F?

Connect 22 per cent on % Soda Ash scale with temperature of 76°F — note that straightedge intersects viscosity scale at 4 centipoise.

In addition to viscosity, heat of solution, solubility, and similar data, this illustrated, hard-bound book covers analytical methods, chemical reactions, handling and storage, and gives a compact rundown of the manufacturing and marketing picture of soda ash and other alkalis. "Soda Ash" is issued by Wyandotte Chemicals Corp., Dept. CP, Wyandotte, Mich. . . . or for more information check CP 2840 on form opposite last page.



LITERATURE CITED

(1) ROBERTS, MANGOLD, *Ind Eng Chem*, Vol. 31, p 1294 (1939)



Magnetic Separators keep lithium free from IRON CONTAMINATION

Just before bagging lithium ore, Foote Mineral Company runs this material through two Frantz Model 88V FERROFILTERS. These separators remove the smallest magnetic particles from the powdery material (as fine as 200 mesh) to assure delivery of an iron-free product. If iron contamination is eating into your profits — endangering customer good will — it's time to investigate Frantz FERROFILTERS.

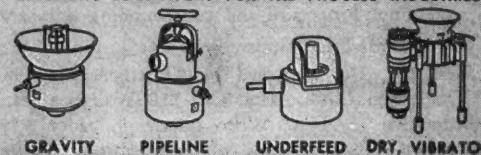
S. G. FRANTZ CO., Inc.

Brunswick Pike & Kline Ave.
P.O. Box 1138
Trenton 6, N.J.

Model 88V FERROFILTER with average dry material capacity of 5 to 25 tons per hour. 5 smaller Model 68V handles 1 to 5 tons per hour. Powerful vibrator speeds flow of coarse and fine materials.

Send for BULLETIN 46-E

MAGNETIC SEPARATORS FOR THE PROCESS INDUSTRIES



When inquiring check CP 2841 opposite last page

CHEMICAL PROCESSING

NEW LITERATURE

Helps choose epoxy resins

Epoxy resin selection chart enables manufacturers to choose a resin for their impregnating, insulating, or potting requirements. Chart is divided into three sections covering room-temperature, moderate-temperature, and moderate-high-temperature curing systems. A page of text accompanies the chart, describes the manufacturer's Epocast systems.

"Epoxy Resin Selection List" is issued by Furane Plastics Inc., Dept. CP, 4516 Brazil St., Los Angeles 39, Calif. When inquiring check CP 2842 opposite last page.

Shows sink trap of plastic

Revised design of polyethylene sink trap is shown in illustrated data sheet. Construction, dimensions, and applications are given.

Sink Trap Data Sheet is issued by Arthur S. La Pine & Co., Dept. CP, 6001 S. Knox Ave., Chicago 29, Ill. When inquiring specify CP 2843 on form opposite last page.

Explains stainless pump for corrosives

Stainless steel centrifugal pump designed for economical handling of corrosives is described in one-page flier. Mechanical features, performance data, materials of construction, and operating advantages are covered.

Bul on Centri-Chem pump is available from Eco Engineering Co., Dept. CP, 12 New York Ave., Newark, N.J. Specify CP 2844 on form opposite last page.

For more information on product at right, specify CP 2845 . . . see information request blank opposite last page.



ONE MORE REASON TO CHOOSE PRITCHARD COOLING TOWERS:



DOUBLE PANELS INSURE TIGHTER CASING ON ALL PRITCHARD TOWERS!

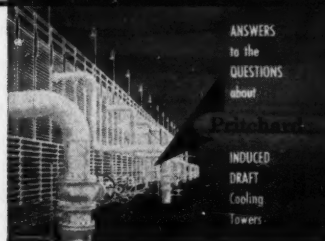
The inner and outer panels, separated by a two inch nominal air space, are bolted to the tower for permanently tight horizontal joints.

This nailing machine is used for precision assembly of Pritchard casing panels. Machine nailing insures superior construction.



FASCINATING READING!

Anyone interested in cooling towers or interested in learning more about cooling towers will find "Answers to 15 Questions about Pritchard Induced Draft Cooling Towers" fascinating reading! Far more than a mere catalog, this brochure has valuable advice on factors to consider in choosing towers, reliable tips on evaluating cooling tower bids. Illustrations plus cross-sectional painting take you right inside typical Pritchard tower. Write for this brochure today on your company letterhead!



ANSWERS
to the
QUESTIONS
about

INDUCED
DRAFT
Cooling
Towers

Pritchard's unique casing design insures tighter panel joints and greater protection for Pritchard towers. The inner and outer panels, separate from each other, can move independently without causing gaps between panels.

All panels are factory assembled in jigs and machine nailed, even when Pritchard does not perform the field labor. Outer panels are of Clear All Heart Redwood. Inside panels are Select Heart Redwood or better. Clear All Heart trim strips, bolted to the tower, permit expansion and contraction of the casing while holding it firmly in place. Ship lap joints are placed so that drainage is to inside of tower. Each casing board is carefully planed to size for uniformity of fit.

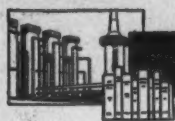
Pritchard's unique, superior casing is one more reason to choose Pritchard cooling towers!

INDUSTRY'S
PARTNER FOR
PROGRESS
COOLING TOWERS
GAS & AIR TREATING EQUIPMENT

REPRESENTATIVES
IN MAJOR CITIES
FROM COAST
TO COAST

J.F. Pritchard & Co.
OF CALIFORNIA

A DIVISION OF J. F. PRITCHARD & CO.
Dept. 495, 4625 Roanoke Parkway, Kansas City 12, Mo.



Estimating Filling and Breathing Losses for Standard Cone Roof Tanks

Courtesy of GENERAL AMERICAN TRANSPORTATION CORP.

As standard cone roof tanks heat and cool with daily temperature cycles, vapor is expelled and air is drawn in. One nomograph given here permits rapid estimation of material lost as vapor in the "breathing" process.

While breathing loss chart is empirical, it is based on a $\frac{3}{4}$ -inch per foot roof pitch and one ounce per square inch difference in pressure between pressure vent opening and vacuum vent opening. For roof pitches other than this, make outage adjustments for cone roof volume. For deviations of pressure-vacuum differences from one ounce, reduce breathing loss 7.7 per cent for each additional ounce. Color (radiation absorption) of tank is important, too. Nomograph is based on weathered aluminum tanks. For chalk white

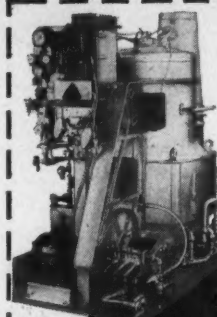
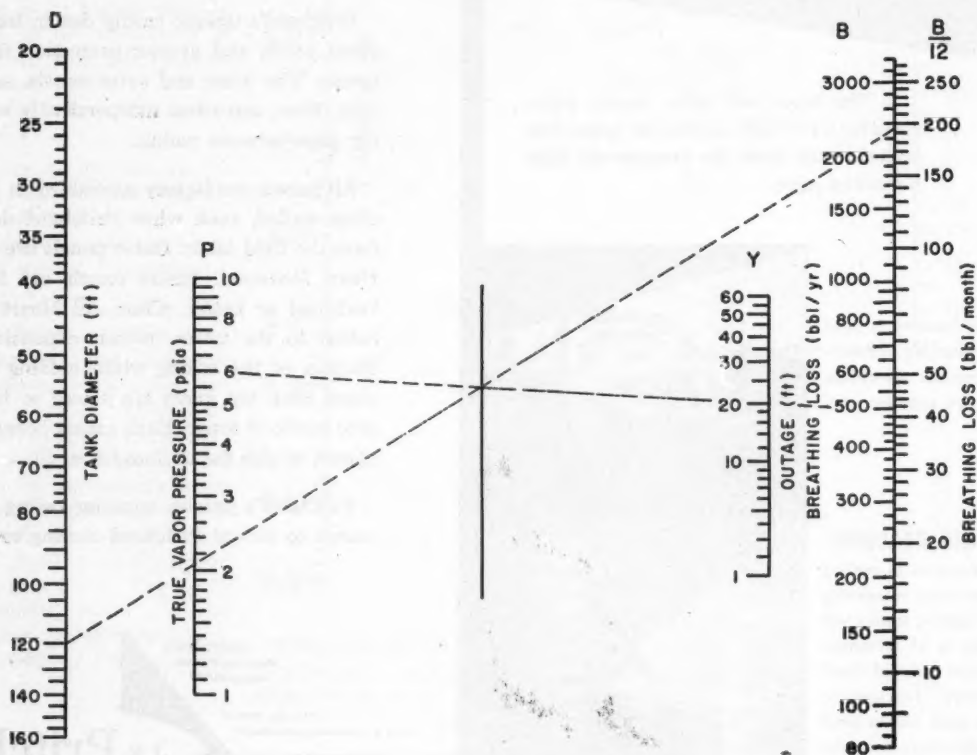
tanks multiply resultant loss by 0.75, for light gray — 1.10, for black or no paint — 1.25.

Typical Breathing Loss Example

True vapor pressure of stored liquid is 6.1 psia. If an aluminum 120-ft diam tank has 20 feet of outage, what is annual breathing loss? Monthly breathing loss?

Connect 6.1 on vapor pressure scale with 20 on outage scale. Note intersection with reference line. Pivot on this reference to intersect 120 on diameter scale and read breathing loss as 195 barrels per month or 2340 barrels per year. Note that if tank had been unpainted, losses would have been 1.25 times as great — 244 bbl/month or 2920 bbl/yr.

(Continued on page 208)



Need steam @
200 to 1,000 p.s.i.
... 500 to 10,000
lbs. per hour?

for this
and every heat,
power, or processing use,
there's nothing like
MODULATIC
STEAM GENERATION

Want higher steam pressures... more capacity... sustained output you merely set and forget? This, *and much more*, now can be yours in the versatile Modulatic—world's most compact power package:

1. Steam-making at its best. Heat-release: from 10 to 20 times greater than found in the usual firebox. Heat-transfer: up to 400% better than that in conventional boilers. Modulatic has no "dead" areas.

2. Unmatched modulating characteristics. Tracks fluctuating load accurately, up or down. Rapid pressure recovery. Delivers steam in pressure and volume desired—as it's needed. Can't waste fuel or water. Fuel consumption is exactly proportional to steam used.

3. Installs anywhere. Passes complete through plant-type doorways. Goes in basement, boiler-house; on factory floor, balcony, roof. Clean, quiet—needs no enclosure or expensive foundation or stack. Oil, gas, or flip-switch combination burner. ASME Code. UL-approved.



Modulatic brings you a
wholly new concept of in-
dustrial steam generation.
Wire Vapor Chicago, collect
today. Just say "Number 53."

VAPOR HEATING CORPORATION

80 E. JACKSON BLVD., CHICAGO 4, ILLINOIS
Vapor Car Heating Co. of Canada, Ltd., 65 Delhomme St., Montreal 3

When inquiring check CP 2846 opposite last page

CHEMICAL PROCESSING

Data on granular, glass-reinforced, putty alkyd molding compounds

Plaskon alkyd molding compounds, low-pressure high-speed thermoplastic materials, are treated in four-page data bulletin. The granular, putty, and reinforced materials are covered. One graph and table accompany the text.

"Plaskon" is issued by Barrett Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. When inquiring specify CP 2847 on form opposite last page.

Forged steel stop-check and needle valves

Forged steel stop, stop-check, and needle valves are subject of six-page folder. Full description and specs are included on the valves which range up to 2" size. A number of photographs are included.

Bul 551 is issued by Edward Valves, Inc., subsidiary of Rockwell Mfg. Co., Dept. CP, 1201 W. 145th St., East Chicago, Ind. When inquiring check CP 2848 on form opposite last page.

Complete line of paper machines pictured, described in detail

Manufacturer's complete line of paper bag machines is given comprehensive treatment in illustrated brochure. Included are specialty, grocery, multiwall, and carrier bag machines. Paper strap, slicers, and other specialty machines are also described. Full specifications are given for each unit.

Brochure "Weber Paper Bag Machines" is issued on letterhead request by H. G. Weber & Company, Inc., Dept. CP, Kiel, Wisconsin.

Lists chromatographic aluminas and indicating anion resins

Price list shows availability of analytical grade chromatographic alumina and anion exchange resins which have been treated with an indicating dye to change color reversibly in going from hydroxide to other ionic forms. The four-page list describes neutral, acid, and basic type aluminas; two strongly basic resins containing quaternary ammonium groups; and current information on analytical grade anion and cation exchange resins.

Price List "L" is issued by Bio-Rad Laboratories, Dept. CP, 800 Delaware St., Berkeley, Calif. Check CP 2849 on form opposite last page.

McKee's 50-year history records a long, continuous experience with Ross Exchangers

Numbered among the world-wide refinery achievements of the Arthur G. McKee Company, is an impressive list of Ross Exchanger installations dating back many, many years. A mere handful is shown here. What better tribute could there be to the continually high calibre of Ross equipment and to the sound policies of the Kewanee-Ross organization . . . itself, an oldtimer in the refinery field. Kewanee-Ross is proud of this long, successful association.

Keeping old customers satisfied is a specialty of Kewanee-Ross . . . one that is continually influencing new ones to bring their exchanger and condenser problems here. Proof is in the steady growth of the Company. We have the facilities and the manpower to serve you successfully, too.

KEWANEE-ROSS CORPORATION

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION
1403 West Avenue • Buffalo 13, N. Y.
In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.

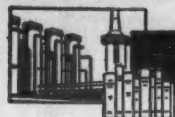


**EXCHANGERS
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Serving home and industry: AMERICAN STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

When inquiring check CP 2850 opposite last page



Filling Losses From Cone Roof Tanks

(Continued from page 206)

When tanks are filled and vapor space is taken up by new liquid, expelled vapors cause losses. This empirical nomograph has two scales for tank turnover (K_t -scale). One of these represents the situation in general refinery service — rapid filling and emptying of tanks. The other scale, Marketing Plants & Terminals, prevails where rapid tank filling is followed by slow discharge or repeated discharge of small lots. Both scales read directly in number of turnovers per year.

This nomograph is also designed so that if throughput data falls outside scale range, it may be divided by a multiple of ten. Filling loss is then adjusted by multiplying by same multiple.

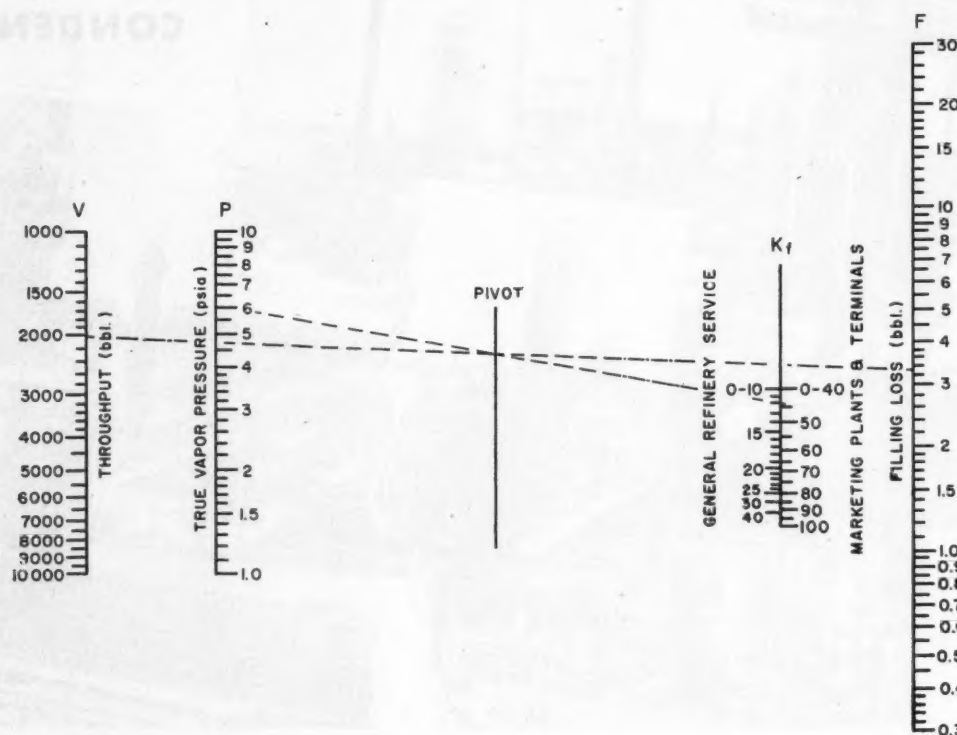
Typical Filling Loss Example

A refinery is storing a hydrocarbon with a true vapor pressure of 6.1 psia. Each year about 1,000,000 barrels are put through an 80,000-bbl cone roof tank — for a turnover of about 12 per year. What annual

filling loss can be expected?

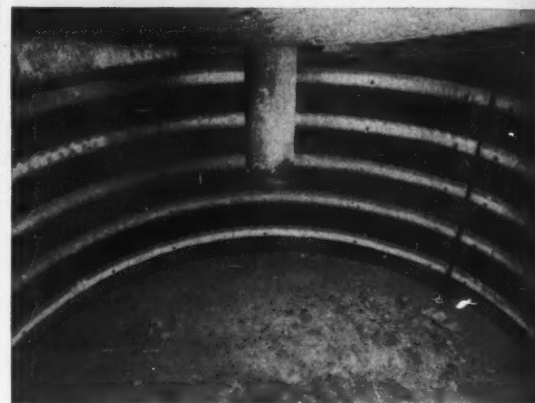
Align true vapor pressure with number of turnovers. Use 12 on *General Refinery Scale* for turnovers. Note intersection on reference line. Pivoting about this reference point, find proper throughput on throughput scale. Since 1,000,000 barrels is off scale, divide by any multiple of ten — say 500. $1,000,000 \text{ bbl}/500 = 2000 \text{ bbl}$. Align 2000 bbl throughput with reference point found earlier and read filling loss of 3.3 bbl. Multiply filling loss by 500 to compensate for earlier division and obtain annual loss as 1650 barrels.

These nomographs are taken from "How to Reduce Evaporation Losses," a data book on storage tanks. Other nomographs contained in it include conversion from Reid to true vapor pressure, standing storage losses, and expansions for air-vapor mixtures. This book is issued by General American Transportation Corp., Dept. CP, 135 S. LaSalle St., Chicago 90, Ill. . . or for more information check CP 2851 on handy form opposite last page.



CONTROLLED RADIANT HEAT FOR 16 YEARS—NO "DOWN-TIME"

...with TRENT "FOLDED-and-FORMED" Heating Units



Interior of asphalt kettle jacket showing heating elements after 16 years continuous operation. Note condition of elements and porcelain supports.

BARRETT DIVISION, Allied Chemical & Dye Corporation, reports sixteen years continuous operation of two large asphalt kettles heated by Trent "Folded-and-Formed" Heating Units. Officials at the company's Chicago plant found the heating units still in excellent condition when replacements were made only to meet new voltage requirements! This outstanding record for long radiant heating element life is typical of the standards set by Trent "Folded-and-Formed" heating units in the chemical processing industry.

Trent exposed ribbon type resistor heating elements have proven their advantages wherever high-temperature, controlled radiant heat is essential for efficient processing operations. The unique construction of Trent "Folded-and-Formed" heating elements provide a greater radiating surface per square inch of element cross-section than any other type of electrical heating element . . . plus—

- LONGER LIFE ● FASTER CONTROL RESPONSE
- NO "DOWN-TIME" ● HIGHER TEMPERATURES
- WELDED INTERNAL CONNECTIONS



Asphalt kettle being removed from jacket for first replacement of heating units in 16 years. New Trent "Folded-and-Formed" units were installed only to meet new voltage requirements.

Let an experienced Trent Heating Engineer show you how you can get better controlled, radiant heat with long-life Trent "Folded-and-Formed" Heating Elements . . . or ask to see the new Trent "Folded-and-Formed" Heating Element booklet.

Photos courtesy BARRETT DIVISION of Allied Chemical & Dye Corp., Chicago, Ill.



When inquiring check CP 2852 opposite last page

CHEMICAL PROCESSING

Whys and hows of aluminizing H_2SO_4 converters, exchangers

Single-page data sheet is of interest to those concerned with degradation of vanadium catalyst in H_2SO_4 production. Corrosion products flaking off unprotected steel dome of H_2SO_4 converters, or fouling and subsequent loss of heat-transfer efficiency of uncoated exchangers are responsible for this. Advantages of aluminizing H_2SO_4 converters and heat exchangers to reduce this source of contamination are enumerated, and technique for obtaining superior protective resurfacing is given.

Bul 125 is issued by Emjay Maintenance Engineers, Dept. CP, 327 Union Ave., Rutherford, N. J. Check CP 2853 on form opposite last page.

Handbook on stainless steel wire, rod, and strip

Properties, specifications, applications, and design information on stainless steel wire, rod, and strip are given in 38-page handbook. Handbook was planned to help in the proper selection of the right grade of stainless steel for a particular application.

Design handbook on stainless steel wire, rod, and strip is issued by Alloy Metal Wire Div., H. K. Porter Co., Inc., Prospect Park, Pa. When inquiring specify CP 2854 on form opposite last page.

Lubrication and construction of plug valves

Best methods for lubricating plug valves is one topic covered in 18-page illustrated booklet. Booklet also gives cross sectional views of a variety of plug valves and goes into considerable detail regarding their construction.

Manual No. 3 is issued by ACF Industries, Inc., Valve Div., Dept. CP, 1501 E. Ferry Ave., Detroit 11, Mich. When inquiring specify CP 2855 on form opposite last page.

Booster and diffusion applications of vacuum pumps

Use of vacuum pumps in diffusion and booster service is outlined in an eight-page, pocket-size booklet. Designed features and capacities are given.

Bul 756 is available from F. J. Stokes Machine Company, Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. When inquiring specify CP 2856 on form opposite last page.



Hopper-level view of Dracco Multi-Bag Filter, heart of a major steel company's dust recovery system. 52,000 cfm of fumes are filtered continuously at 99½-100% efficiency and collected dust is discharged and moved to storage. With only clean air exhausted, air pollution is avoided.

► air pollution halted...at a profit!

Air pollution is one of industry's biggest and most costly problems. But here's how one major steel company cleaned up a "hot" situation by controlling fumes from its secondary bronze smelter—at a profit!

Zinc oxide-laden clouds from the smelter were formerly being exhausted to the atmosphere, causing waste of valuable materials and complaints from a nearby housing development. A Dracco Dust Recovery System consisting of cooler, filter and dust conveyor has been installed to alleviate this problem.

The cooler receives fumes at 2000°F and discharges them at 235°F to the filter where zinc oxide is collected continuously. Only clean air is exhausted—all visible dust has been removed. The dust conveyor carries collected material to storage.

As a result of this corrective action, pollution of air from this source has been eliminated. The company is

realizing new profits from the sale of materials formerly lost to the atmosphere.

Your plant may be causing unhealthful air pollution and wasting valuable materials unnecessarily. A Dracco dust control engineer will show you how you can convert these losses to profits, and improve relations with your community. Call him today!

DRACCO CORPORATION
4070 East 116th Street • Cleveland 5, Ohio

Want more information on Industrial Dust Recovery and Control? Write today for the 40-page Dracco Bulletin No. 800.

DRACCO *Performance Proved*
Airstream CONVEYORS • DUST CONTROL EQUIPMENT

When inquiring check CP 2857 opposite last page



Estimating Rates For Roof Ventilators

By D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

For chemical and other plants, maximum rate of flow of air through a natural roof ventilator can be calculated by the equation

$$Q = 0.200 L^{\frac{1}{2}} H^{\frac{1}{2}} A^{\frac{1}{2}}$$

where —
Q = maximum ventilation rate thousands of cfm
L = effective height of warm air inside building ft
H = rate of heat release to interior air thousands of Btu per minute
A = area of roof ventilator assuming no restriction to supply of air to lower part of building sq ft

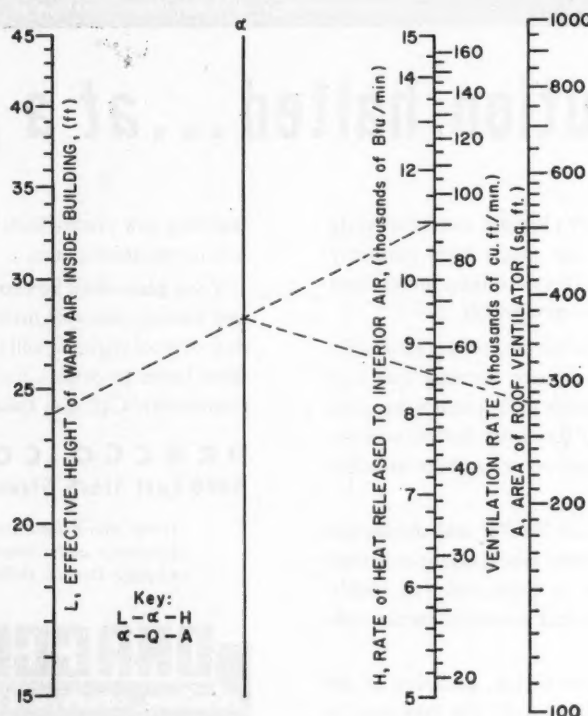
This equation, adapted from information given by Hemeon³, can be solved quickly by nomograph given here. Nomograph was constructed by methods described previously^{1, 2}.

Typical Example

What is the maximum ventilation rate for a building 27 feet high capped by a 280 square foot roof ventilator if 11,000 Btu/min are released to interior air? Assume effective height of warm air inside building to be 24 feet — a little less than height of building. Following key, connect 24 on L-scale with 11 on H-scale. Then connect α -scale intersection with 280 on A-scale. Read ventilation rate as 55 thousands of cfm (55,000 cfm).

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- (1) DAVIS, D. S., "Empirical Equations and Nomography," Chap. V, McGraw-Hill Book Co., New York (1943)
- (2) DAVIS, D. S., "Nomography and Empirical Equations," Chap. VI, Reinhold Publishing Corp., New York (1955)
- (3) HEMEON, W. C. L., "Plant and Process Ventilation," p396, The Industrial Press, New York (1955)



Economical

... for Producing Powdered Materials

**RAYMOND
RAY-DUCER**

Accessible

... for changing or removing screens



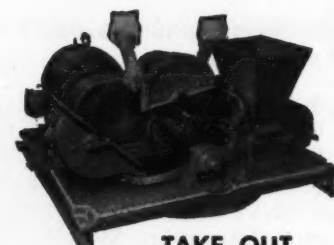
**OPENS
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**TAKE OUT
SCREEN UNIT**

You will like this compact, time-saving unit for economical production of powdered materials. The complete mill with motors, variable speed drive and feed hopper mounted on prefabricated metal base.

Ruggedly built for continuous operation in grinding or disintegrating a great variety of medium soft materials. Built in three sizes for different capacity requirements.

For further details, write for Raymond RAY-DUCER Bulletin No. 80

COMBUSTION ENGINEERING, INC.

1317 North Branch St. Raymond Division Chicago 22, Ill.

Sales Offices in Principal Cities
Combustion Engineering - Superheater, Ltd.
Montreal, Canada

When inquiring check CP 2858 opposite last page

CHEMICAL PROCESSING

Portable gamma ray sources for industrial radiography

Discussion of radio-active materials, isotopes, kinds of radiation, and shielding introduce 24-page booklet on portable gamma ray projectors. Three gamma ray sources used are explained, and operation and construction features given. Gamma ray sources include cobalt 60, cesium 37, and iridium 192. Special section of booklet is devoted to gamma ray intensity and a film exposure guide. Regulations of the Atomic Energy Commission covering use of radio-isotopes and radiographs made with gamma ray projectors are also included.

"Kel-Ray Projectors" may be obtained from Metal & Thermit Corporation, Dept. CP, 100 E. 42nd St., New York 17, N. Y. When inquiring specify CP 2859 on form opposite last page.

DC tubeless power supply— germanium rectifiers

Specifications and applications of germanium rectifier, DC tubeless power supply, are discussed in two-page bulletin. Model illustrated has voltage range of 115 to 125 volts at 25 amp with an efficiency of 94%.

Bul G125-25A is issued by Perkin Engineering Corp., Dept. CP, 345 Kansas St., El Segundo, Calif. Specify CP 2860 opposite last page.

Engineering facts about Hypalon, general purpose elastomer

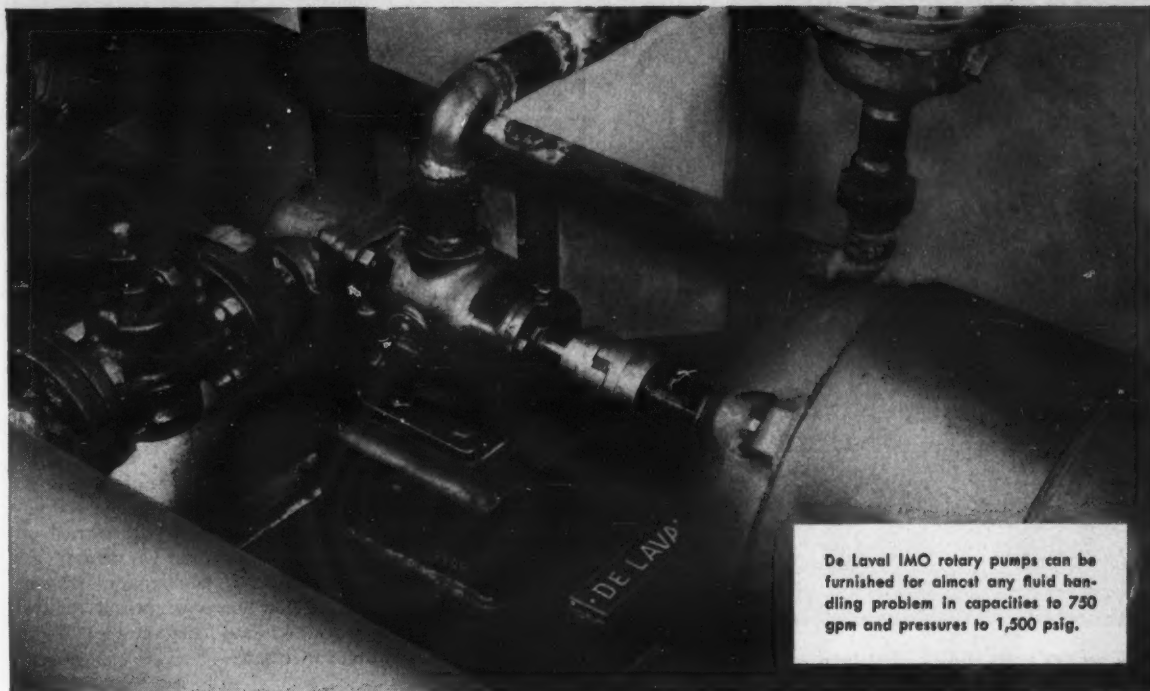
Graph depicting heat aging characteristics, conditions of use, and application case history for general purpose elastomer are given in two-page pamphlet.

"Facts about Hypalon" is issued by Elastomers Div., E. I. du Pont de Nemours & Co., (Inc.), Dept. CP, Wilmington, Delaware. When inquiring specify CP 2861 on form opposite last page.

Gives information on soda ash

Information on production, grades, and distribution of soda ash is given in four-page, two-color folder. Illustrations of using industries are included.

"Trona Soda Ash" is issued by American Potash and Chemical Corp., Dept. CP, 3030 W. Sixth St., Los Angeles 54, Calif. When inquiring specify CP 2862 on form opposite last page.



De Laval IMO rotary pumps can be furnished for almost any fluid handling problem in capacities to 750 gpm and pressures to 1,500 psig.

What to Look for in a Rotary Screw Type Pump

By W. J. MONGON, Assistant Chief Engineer
De Laval Steam Turbine Company

A sound knowledge of design, and how it affects performance, is the best insurance a buyer can have that he will get the pump he needs. This brief analysis of the IMO, a rotary three-screw pump manufactured by the De Laval Steam Turbine Company, will give you some of the necessary facts.

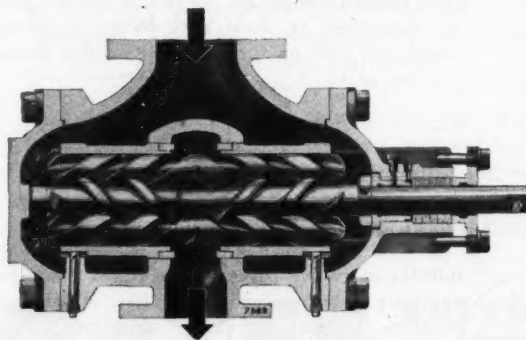
What qualities should you look for in a rotary type pump? It must, of course, meet specified capacities and pressures. But, it must also be efficient, operate quietly, stay on the job.

The axial flow of a screw type pump, and the resulting low inlet losses for any given pump speed, are important

benefits that should be considered in making pump selections. The absence of timing gears and other mechanical features of construction also enable the De Laval IMO pump to operate at direct-connected motor and turbine speeds . . . to handle viscous liquids and high suction lifts.

One of the most important features of the IMO pump is the hydraulic turning of the idler or sealing rotors. The central or power rotor is the pumping element; the liquid pumped turns the sealing rotors.

A screw type pump is well suited for applications where pulsation-free flow is desirable. The axial flow of the liquid without trapping and the unique thread form which keeps closures fluid-tight contribute to quiet operation of the IMO pump.



De Laval IMO Series A322A, a positive displacement, rotary screw type pump, can handle capacities to 750 gpm and pressures to 150 psig.

Catalog LS gives useful application and specification data on the IMO pump. An article titled, *Rotary Pumps, Basic Considerations in Their Application*, contains a description of rotary pumps in general. For these publications, write on your company letterhead to De Laval Steam Turbine Company, 889 Nottingham Way, Trenton 2, New Jersey. DL-301



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Conveyor Dryers*



You can stay in the lead . . . with faster production, lower operating costs and improved product . . . through operation of "NATIONAL" Conveyor Dryers . . . the ultimate in modern Dryer design and efficiency. Pictured above: Upper, large Multiple-Unit, Multiple-Apron dryer; lower, fourteen-section Multiple-Unit Single-Apron machine.

NEW "P-4" CONSTRUCTION

"P-4" Construction means a precision-built, prefabricated, truss-type structure, providing a new measure of strength, rigidity and durability. Advantages to the customer are obvious: Longer service life for the Dryer; smoother operation; freer access for cleaning and maintenance; and reduction of installation time in the customer's plant of as much as 50%. Another important feature of "P-4" Truss Type Construction is that the special method of attaching the panels meets all Underwriter's Codes covering explosion hazards.

IMPROVED HOUSING PANELS

The new insulated panels (Patented and Patents Pending) used for the housing are larger, stronger, more rigid, and, with their 4" insulation, provide greater protection against heat loss. They are of trussed-and-tensioned, non-through-metal construction and incorporate expansion-contraction compensation.

IMPROVED AIR DISTRIBUTION AND CONTROL

The exceptionally high drying speed of "NATIONAL" Dryers results from a combination of adjustable fan power and unique air distribution system, controlled to assure equal volume of air to the entire run. There is no "shading" — no uneven drying. This arrangement permits drying at consistently higher speeds than those previously permissible. Patented Indexing Orifices, Turning Vanes and other devices and arrangements assure unequalled versatility and precision in air distribution and control.

SUPER-POWER FANS

"NATIONAL" has developed the adjustable-pitch principle into its axial-flow fans which provides for greater operating potential than heretofore used in any drying machinery. Greater speeds and volume of air can now be employed and adjusted to the specific requirements of the drying operation. The new fan construction includes special alloyed metals fabricated by an improved welding technique. The Fan mountings, insulation and lubricating systems have also been redesigned to provide improved smoothness of operation and virtually no maintenance. Other features of "NATIONAL" Conveyor Dryers include continuous hopper feeds; automatic leveler to conveyor belt; pressure extraction and heating for pre-drying.

Write for Complete Information
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LENIGH AVENUE and HANCOCK STREET
PHILADELPHIA 33, PENNA.

New England Agent: JONES & HUNT, INC., Gloucester, Mass.
Cable Address: "NADRYMA" — W. U. Code

new literature

(Continued from preceding page)

Air and gas dehydration with silica gel

A report on research in dehydration of air and gas with manufacturer's silica gel is covered in sixteen-page technical bulletin. Research was carried on at Southwest Research Institute, a natural gas plant, in manufacturer's laboratories. Twelve graphs, charts, and flow sheets accompany the text and supply much technical data on the subject, and its many variables.

Tech Bul No. 201 is issued by Davison Chemical Co., Div. of W. R. Grace & Co., Dept. CP, 101 N. Charles St., Baltimore 3, Md. When inquiring check CP 2864 on form which is located opposite last page.

RATS! History of a strain up to rat No. 1,000,000

Commemorating the one millionth rat born since the founding of an animal colony in 1923, industrial laboratory has published an eight-page booklet about one of their products — rats. Complete with an almost life-size die-cut white rat on each page, booklet describes background, important considerations in raising rats, diet, selectivity, shipment methods, and other details pertinent to the rodents.

"Rats for Research" is available from Supplee Div., Foster D. Snell, Inc., Dept. CP, 29 W. 15th St., New York 11, New York. When inquiring specify CP 2865 on form which is located opposite last page.

Outlines miniature instruments for control

Bulletin of twelve pages in two colors describes miniature recorders and controllers of process variables. Instruments operate on a pneumatic-balance principle to eliminate lost motion and reduce friction to a minimum. Recorder and indicator specifications are given. Schematic diagram of basic model in instrument system is given.

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

Block diagrams are included for typical installations.

Bulletin 7202 "Tel-O-Set Instruments" is issued by Industrial Division, Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. When inquiring specify CP 2866 on form opposite last page.

Phantom drawing shows fork truck make-up

Printed in three colors, four-page folder features a large phantom view of typical fork truck with torque converter. Transmission, brake system, motor, cooling system, radiator, and other vital parts are shown in their true position.

Folder 2414 is issued by Yale Materials Handling Div., The Yale & Towne Mfg. Co., Dept. CP, 11000 Roosevelt Blvd., Philadelphia 15, Pa. When inquiring specify CP 2867 on form opposite last page.

Covers impervious graphite pipe, fittings, and valves

Twelve-page catalog gives properties and recommended applications of pipe, fittings, and valves fabricated from corrosion-resistant impervious graphite.

Catalog 965 is issued by Falls Industries Inc., Dept. CP, 21909 Aurora Rd., Solon, Ohio. When inquiring specify CP 2868 opposite last page.

Rubber-phenolics design file

Rubber-phenolics applications are subject of revised handbook treating molding compounds based on a combination of phenolic resin and synthetic rubber.

CDC-237A is available from Chemical Materials Dept., General Electric Co., Dept. CP, Pittsfield, Mass. Specify CP 2869 opposite last page.

When inquiring check CP 2863 opposite last page

Describes demonstrator of nuclear reaction

Including a block diagram to illustrate theory of simulator's operation, four-page folder illustrates nuclear reactor simulator assembly. Photos show instrument's chief components, said to be identical to those used in research reactors presently in operation. Simulator described can demonstrate operation of at least five kinds of reactors, including thermal reactors and pool types.

Folder ND-46-70-700(2) is issued by Leeds & Northrup Co., Dept. CP, 444 N. 16th St., Philadelphia 30, Pa. When inquiring specify CP 2870 on form opposite last page.

Shows labware packing method that prevents breakage

Packages for storing and shipping laboratory glassware are described in this four-page, two-color brochure. Known as "Air-Pak" these containers provide bursting pressure protection of about 525 psi compared with about 275 psi for conventional containers. Brochure cites savings due to reduced breakage in shipment.

"Tomorrow's Packaging . . ." is issued by Doerr Glass Co., Dept. CP, Vineland, N. J. Specify CP 2871 on form opposite last page.

Shows level indicator using gamma rays

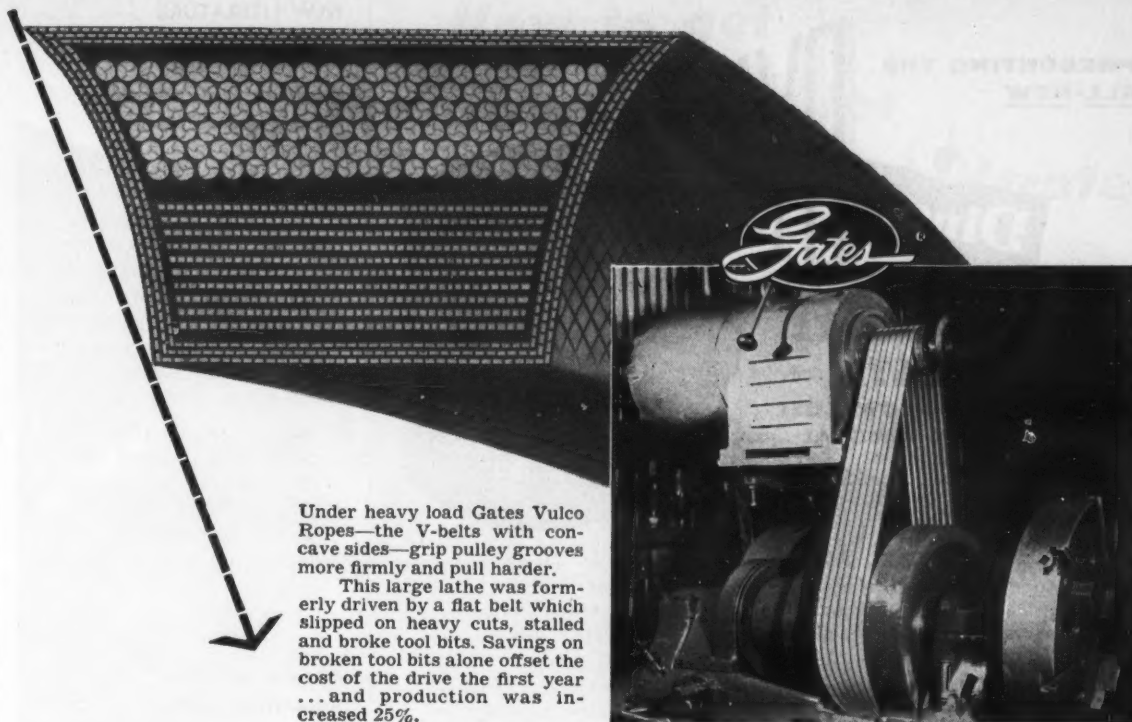
Bulletin of four pages describes technique of using gamma ray absorption for level indication. Example shown in bulletin describes level control for petroleum coke. Block diagram and pictures are used to explain equipment and method of operation.

Bul P-102 is issued by Tracerlab, Inc., Dept. CP, 130 High St., Boston 10, Mass. When inquiring specify CP 2872 on form opposite last page.

Outlines regulating valves for level and pressure

Four-page bulletin describes automatic regulating valves for level and pressure control of steam, air, gas, oil, and water. Valves featured are designed to meet operating conditions involving pressures to 600 psi and temperatures to 750°F.

Folio No. 4 is issued by Schade Valve Mfg. Co., Dept. CP, 2527-37 N. Bodine St., Philadelphia 33, Pa. When inquiring specify CP 2873 on form opposite last page.



Under heavy load Gates Vulco Ropes—the V-belts with concave sides—grip pulley grooves more firmly and pull harder.

This large lathe was formerly driven by a flat belt which slipped on heavy cuts, stalled and broke tool bits. Savings on broken tool bits alone offset the cost of the drive the first year . . . and production was increased 25%.

Concave sides keep belt costs down!



Fig. 1



Fig. 1-A

Industry is saving thousands and thousands of dollars every year by specifying Gates Vulco Ropes—the V-Belts with *concave sides* (U.S. Pat. No. 1813698).

Here's the interesting reason *why* Gates belts save money:

On the bend around the sheave the *precisely engineered* concave sides (Fig. 1) of the Gates belt fill out and become straight (Fig. 1-A). Thus the belt makes uniform contact with the sides of the pulley. That means sure pulling power and *even distribution of wear*. Longer wear, fewer replacements cut belt costs...reduce down time...contribute to profits.



Fig. 2



Fig. 2-A

Simple test proves value of concave sides

Bend a straight-sided belt (Fig. 2) and feel the sides *bulge out* around the bend. The bulging sides prevent the belt from fitting evenly in the pulley groove (Fig. 2-A). Uneven contact causes uneven wear...shortens belt life...increases costs.

Keep belt costs *down* by specifying Gates Vulco Rope Drives—the V-Belt with *concave sides*. Belts you need are readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado—*World's Largest Maker of V-Belts*.

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

VPA 25-A

GATES VULCO ROPE DRIVES

When inquiring check CP 2874 opposite last page

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FOR EFFICIENT—LOW COST
TRAMP IRON REMOVAL



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ALNICO NON-ELECTRIC TYPES
WITH EFFECTIVE MAGNETIC
RANGES UP TO 4"

DINGS—The world's largest exclusive builder of magnetic separation equipment—now brings to all industry an entirely new concept of efficient, low cost tramp iron removal . . . through the completely new line of non-electric Alnico Perma-Plate Magnets, incorporating the **DYNAMIC** principle of magnetic separation.

Designed and built to remove tramp iron from moving material carried in chutes, ducts, on conveyor belts and slides, these new powerful, guaranteed permanent Alnico V magnets are used to separate iron from grain, feed, chemicals, foodstuffs, plastics, fertilizers, minerals, textile fibers, liquids and wet and dry solids of many kinds. Perma-Plates are also needed wherever tramp iron or iron of abrasion can damage processing equipment, create fire hazards, or contaminate product purity.

Clip the coupon for full details.

The new Dings **DYNAMIC** Perma-Plates are plate type permanent non-electric Alnico magnets designed to attract moving iron. This proven design is the result of hundreds of extensive *dynamic* tests . . . not based on static tests.



As shown by illustrations (1) and (2), a *pull test* is a static test having negligible bearing on the magnet's ability to attract rapidly moving iron. It is not *dynamic*.



Illustration (3) shows a *lift test*, again a static test having negligible bearing on the magnet's ability to attract

moving iron. It is not *dynamic*.

Illustration (4) shows a *chute test* . . . the only *true test* of a plate magnet's ability to attract rapidly moving iron. This is the **DYNAMIC** principle of operation of the new Dings Perma-Plate Magnets.

The new Dings Perma-Plates are available in 4 basic types, offering effective magnetic ranges from 2½" through 4". Each type is available in 35 standard sizes from 4" through 72" wide.

Complete details of these versatile **DYNAMIC** Magnets are given in the new Catalog 1205-D, just off the press. Mail coupon for your copy.



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4731 W. Electric Ave., Milwaukee 46, Wis.

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Dings

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SEPARATOR CO.
4731 W. Electric Ave.
Milwaukee 46, Wis.

When inquiring check CP 2875 opposite last page

NEW LITERATURE

Outlines easy titrations on opaque solutions

Discussing uses of redesigned indicating titrator, four-page bulletin in two colors includes suggestions for use. Instrument described has two titration stands. Analysts can run two titrations at the same time. Special mention is made of advantages for testing non-aqueous solutions.

Bul 615 is issued by Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Illinois. When inquiring specify CP 2876 on form which is located opposite last page.

Pictures packless expansion joints

Line of flexible pipe connections used to solve vibration and expansion control problems in industrial and process piping is described in twelve-page catalog. Packless expansion joints covered are used in steam, chemical, oil, and gas lines. Selection factors and installation procedures are given.

Cat EZ-55 is issued by Industrial Div., T. R. Finn & Company, Inc., Dept. CP, 200 Central Ave., Hawthorne, N.J. When inquiring specify CP 2877 on form opposite last page.

Portable potentiometer for field tests

Bulletin of two pages describes portable potentiometer with accuracy of 0.025 μ v. Instrument is designed for field testing and calibrating of temperature instruments. Potentiometer described may be used with any thermocouple.

Bul F 5760-1 is issued by Wheelco Instruments Div., Barber-Colman Co., Dept. CP, 1300 Rock St., Rockford, Ill. When inquiring specify CP 2878 opposite last page.

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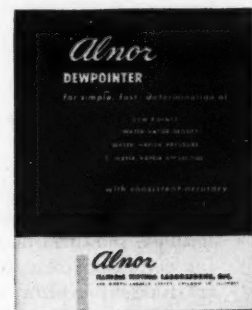
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When inquiring check CP 2879 opposite last page

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**PRECISION INSTRUMENTS
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When inquiring check CP 2880 opposite last page

CHEMICAL PROCESSING

**Covers radiant heat principle
applied to dryers, heaters**

Cutaway view of heating unit accompanies explanation of application of radiant heat to heating and drying in 12-page, two-color booklet. Photos of manufacturer's ovens and heaters utilizing unit are shown. Photos and brief descriptions of drying equipment and washers are included.

Booklet covering ovens, heaters, dryers, and washers is issued by Burdett Manufacturing Co., Dept. CP, 3422 W. Madison St., Chicago 24, Ill. Specify CP 2881 on form opposite last page.

**Urea, melamine, and alkyds
in molding compounds**

Three Plaskon thermosetting molding compounds are presented in four-page folder. Tabular data, physical and electrical properties, chemical resistance, and moldability of the urea, melamine, and alkyd materials are included.

"For Quality and Color in Thermosetting Molding Compounds . . ." is issued by Barrett Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. When inquiring check CP 2882 on form opposite last page.

**Covers variety of products
available in PVC**

About twenty different groups of products available in unplasticized, rigid polyvinyl chloride are described and illustrated in 12-page brochure. Chemical resistance chart is included which shows how well material withstands variety of corrosives.

Catalog G-1, covering Haveg 1810 PVC, is issued by Haveg Corp., Dept. CP, 900 Greenbank Rd., Wilmington 8, Del. When inquiring specify CP 2883 on form opposite last page.

**Shows liquid-level detector
for foam and liquids**

Two-page bulletin in three colors describes capacitance-operated level alarms. Unit pictured is contained in an explosion-proof housing suitable for use in hazardous areas. Operation, application, features and specifications are included. Detector is described as suitable for foam, interface, liquids, and fluidized solids.

Bul Model B-06 is issued by Instruments, Inc., Dept. CP, 122 N. Madison, Tulsa 6, Oklahoma. Specify CP 2884 on form opposite last page.

How to get the right fabrics for clear-flowing filtrates

Maybe filtrate clarity is your problem . . . or the efficient recovery of valuable solids. There's no need to remind you of the hundred-and-one things that can go wrong in a filtration operation. Nor—most of the time—of the reasons why. But isn't it true that many of these production failures could very well be solved by

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- 3) correctly installed?

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Whether it's cotton or synthetic . . .

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. . . in any segment of the chemical or processing

industries . . . there's a Wellington Sears fabric in

use—or one we can develop—that will solve your problem.

In addition, we offer the services of leading filter cloth specialists throughout the country who distribute our filter fabrics. We will be glad to supply the names of distributors, together with a free copy of "Filter Fabric Facts"—illustrated booklet on filter fabric development and application. Write: Wellington Sears Co., Dept. M-12.

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When inquiring check CP 2885 opposite last page

SEND FOR PSC BUBBLE CAP BULLETIN 22

300 Styles Furnished Without Die Cost

This standard reference on bubble caps and risers contains complete specification information for hundreds of variations. Also many drawings for use in determining methods of tray assembly. With dies on hand for all listed styles, PSC can save you substantial die costs as well as design and delivery time. Furnished in any drawing type of metal, to meet your coking or corrosion problems. Assemblies will also be produced to your specifications.



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When inquiring check CP 2886 opposite last page



predictability flowmeters

The names of these new Emil Greiner flowmeters tell the whole story. We believe they are the most important development in flowmeters since the invention of the rotameter. Now you can obtain complete predictability for all fluids!

Heretofore you had to do individual calibrations for each specific fluid. With the Predictability Flowmeter, you can calculate the calibration curve directly, without the need of the experimental calibration that was necessary in the past.

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For Complete Details Write For Flowmeter Bulletin

When inquiring check CP 2887 opposite last page

NEW LITERATURE

Outlines chemicals for farm and industry

Chemicals available from manufacturing for industrial and agricultural applications are outlined in four-page, two-color folder. Compounds included are mineralizing elements for fertilizers, alkyl aryl sulfonates, metallic salts, sulfur dioxide, sulfuric acid, and a partially-hydrated ferric sulfate. Uses, specifications, and packing are discussed.

"Chemicals for Farm and Industry" is issued by Organic Chemicals Div., Tennessee Corp., Dept. CP, 617-629 Grant Building, Atlanta, Ga. When inquiring specify CP 2888 opposite last page.

Structural polyethylene properties

Typical fabrications and applications of polyethylene for chemical engineering construction are given in eight-page illustrated booklet. Properties of tensile strength, elongation, water absorption, chemical resistance particularly to corrosive environments are given. A chart that gives weights per foot of seamless centrifugally cast tubing based on ID and OD is included.

"Plastics for ChE Construction—Polyethylene" is issued by American Agile Corp., Dept. CP, PO Box 168, Bedford, Ohio. When inquiring check CP 2889 on form opposite last page.

Pictures analyzer for flue gas

Two-color bulletin of four pages suggests savings possible by use of flue gas analyzer. Several of manufacturer's models are pictured and described. Instrument is portable and requires only power from 115v for operation.

Portable flue gas analyzer is issued by Thermco Laboratories, Dept. CP, Route 3, P. O. Box 345, Michigan City, Ind. Specify CP 2890 opp. last p.

Recent metallurgical developments in copper-base alloys

Six-page publication on recent metallurgical developments in copper-base alloys calls particular attention to the corrosion resistance and strength of manganese and aluminum bronzes and the cupro-nickels.

Publication on copper-base alloys is issued by the International Nickel Company, Inc., Dept. CP, 67 Wall St., New York 5, N. Y. Specify CP 2891 on form opposite last page.

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When inquiring check CP 2892
opposite last page

CHEMICAL PROCESSING

FAIRLESS

(Continued from page 7)

As a result, automation has become a menacing word — a kind of modern bogey-man with which to frighten our people. And, it is proving effective. For example, a few months ago, the Public Opinion Index took a poll among more than a thousand workers, and asked them two questions: First, did they favor the use of more new and "improved" machines. They did, by about three to one. They were asked how they felt about more automation. But they opposed that, three to two! Yet the two things are, of course, really identical. There is nothing new about automation except the word itself. This thing called automation is simply evolution — not revolution. It is only another little step in the slow and plodding progress of man towards a richer, fuller life, and a better, freer world.

Over the centuries man has accomplished an amazing industrial miracle. He has surrounded himself with luxuries, and greatly lengthened his hours of leisure; but no machine that he ever devised has made us humans obsolete.

Moreover, the record clearly shows that because of mechanization — not in spite of it — employment has rapidly increased since 1939. The building of machines themselves — plus their installation, maintenance, and the construction of new factories to house them — has opened up thousands of job opportunities that never existed before. Even in the specialized field of automation itself, the mere manufacture of the necessary instruments of measurement and control has mushroomed into a three-billion-dollar business which already employs as many men as the auto industry did in the 1930's.

So the time has come to label this propaganda for the fraud it really is. The facts show that only through the widest possible use of new and better machines can we hope to achieve the fullest measure of employment and a higher standard of living. Whether we like it or not, the march of industrial progress will always go on. We can, perhaps, delay it, to our grave national peril, but we cannot ever stop it; for it is an absolute law of nature that every living thing must grow and change so long as life itself continues. That is true of men, and it is true of nations.

The one great advantage we have — our one indispensable weapon during these critical times — is our technology: Our native ability to design, to build and to use the world's most productive machines. We must preserve that advantage at all costs. It is our salvation.

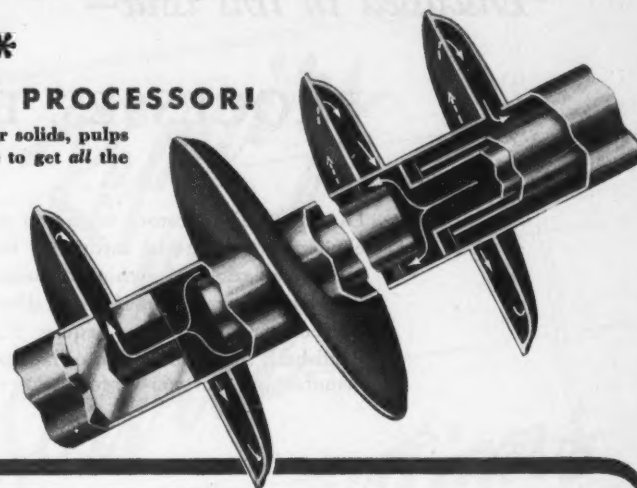
(Copies of Mr. Fairless' address, "Our One Indispensable Weapon", are available upon request from Mr. J. Carlisle MacDonald, Assistant to Chairman, United States Steel Corporation, Dept. CP, 71 Broadway, New York 6, N. Y.)

if you have a Cooling...Heating...or Drying problem
investigate the revolutionary advantages of...

THE **holo-flite*** PROCESSOR!

If you have processes where slurries, granular solids, pulps or pastes are cooled, heated or dried, be sure to get all the facts on HOLO-FLITE advantages.

HOLO-FLITE handles such processes — in continuous flow — in as little as 1/5th the space of other types of heat exchangers. What's more, it is readily adaptable to a wide range of applications — is simple to install and maintain — and provides many other important savings.



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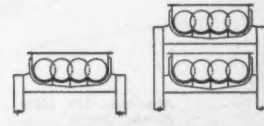
ITS APPLICATION FLEXIBILITY is almost unlimited. It cools, heats, or dries. It handles granular solids, pulps, pastes, slurries and fluids with equal ease. Its heat transfer agent can be water, refrigerant, hot oil, Dowtherm, steam or other liquids or vapors at any of a wide range of temperatures. It cools materials in ranges from 1800°F. to 0°F. It heats and dries with hot oil to 600°F...with Dowtherm to 750°F...with steam to 150 lbs. per sq. in. pressure.



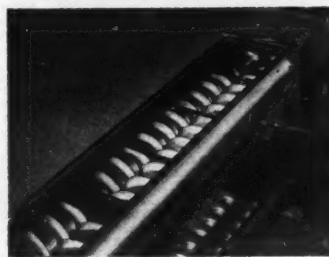
THE LARGE HEAT-TRANSFER SURFACE saves space — HOLO-FLITE requires as little as 1/5th the space of other heat-exchange equipment of comparable capacity. Moreover, a more complete heat transfer is effected, resulting in more uniform processing.



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* T.M. Reg. (Hollow-Flite)

HOW HOLO-FLITE WORKS...

Basically the HOLO-FLITE consists of one or more flights of hollow-bladed screw conveyors. The product to be processed moves through a trough housing the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums — as the product is continuously moved along in a bulk-flow without interruptions!

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PROCESSES, EQUIPMENT and MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to inside back cover and use the convenient "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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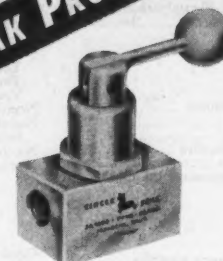
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WAXES

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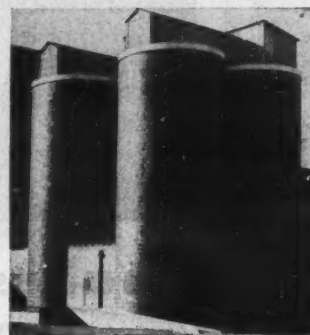
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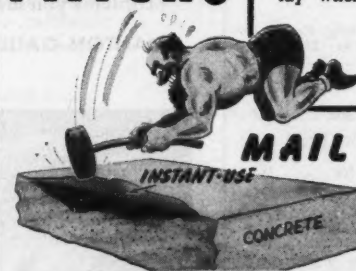
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2510	Fork Truck	2886	Electric Heating Mantle	2725	Compressed-air Controller & Conditioner	2788	Lubricant	2861	General Purpose Elastomers
2511a	Automatic Weighing Systems	2887	Vinyl Acetate Monomer	2726	Threaded Pins	2789	Quick-seal Couplings	2862	Soda Ash
2511b	Load Measurement	2888	Glassware Clamp	2727	Explosion-proof Fittings	2790	High-pressure Valve	2863	Conveyor Dryer
2511c	Torque Measurement	2889	Liquid Scintillators	2728	Stainless and Monel Utensils	2791	Piston Packing	2864	Dehydration with Silica Gel
2512	Vibrating Conveyor	2890	Thermocouple-circuit Monitors	2729	Studding Outlets	2792	Industrial Pump	2865	Bats
2513	Magnetic Separator	2891	Two-motor Mill	2730	Electromagnetic Separation Magnet	2793	Bale Breaker	2866	Miniature Controllers
2514	Woven Wire Products	2892	Mass Spectrometry	2731	Water-tube Boiler	2794	Class H DC Motors	2867	Fork Truck
2515	Pressure Vessel	2893	Filter Presses	2732a	Reclamation Systems	2795	Flexible Hose	2868	Impervious Graphite Pipe
2516	Natural-frequency Vibrating Conveyor	2894	Laboratory Equipment	2732b	"Industrial Applications"	2796	Flexible Metal Hose	2869	Rubber-Phenolic Materials
2517	Portable Stacker	2895	Plastic Trap	2732c	Laboratory Tests	2797	Methyl Parathion		
2518	Shovel Tractors	2896	Tubular Gage Glass & Glass Cylinder	2732d	Product Tests (state which)	2798	Molybdenum Catalysts	2870	Nuclear Reactor
2519a	Gas Trucks	2897	Hydrogen Sulfide Sampler	2733	Diaphragm Valve	2799	Plastic Lining	2871	Air Pak
2519b	Workovers	2898	Solvent-recovery Stills	2734	Ball Joints	2800	Proportioning Pumps	2872	Level Indicators
2519c	Electric Trucks	2899	Celite Filter Aids	2735	Electric Motor-driven Compressors	2801	Mass Spectrometer	2873	Regulating Valves
2519d	Hand Trucks	2900	Control Valves	2736	Multiple Outlet Headers	2802	Water, Air, Oil Valves	2874	Concave-sided Rope Drive
2519e	Lift Truck Attachments	2901	X-Y Plotter Keyboard	2737a	Disolvers	2803	Activated Alumina	2875	Plate Magnet
2520	Storage Bin	2902	Gel-time Meters	2737b	Mills	2804	Molybdenum Disulfide Lubricants	2876	Indicating Titrators
2521a	Bulldozer Drawbar Tractor	2903	Comparator	2738	Metallic Filter Cloth	2805	Carbon Black Pellets	2877	Expansion Joints
2521b	Tractor Shovel	2904	Water Bath	2739	Reversible Fan	2806	Air-operated Machine Tools	2878	Portable Potentiometers
2522	Aluminum Conveyor	2905	Manometer	2740	Grease Monkey	2807	Humidity Conditioning	2879	Purchasing Guide Book
2523	Pallet Dolly	2906	Low Temperature Cabinet	2741	Dust Collectors (state requirement)	2808	Silent Check Valve	2880	Dew Point Indicator
2524a	Chemical Feeders	2907	Vapor Fractionator	2742	Rotary Drum Pressure Filter	2809	Vertical Turbine Pumps	2881	Dryers
2524b	Force Feed Lubricators	2908	Hot Water Heating System	2743	Valve Plugs	2810	Surface Coating Formulations	2882	Urea, Melamine, Alkyds in Molding Compounds
2525	Conical Dryer	2909	Wire Cloth	2744	Refractories	2811	Control Supplement	2883	Polyvinyl Chloride Equipment
2526	Tube Mills	2910a	Pressure-sensitive Labels	2745	Dust Recovery and Control Filters	2812	Dispersers	2884	Liquid-level Detector
2527	Drying Equipment	2910b	Electric Label Dispenser	2746	Filters	2813	Valves and Fittings	2885	Filter Fabric
2528	Ion Exchanger	2911	Volatile Filling	2747	Rotary Pump	2814	Dryers	2886	Bubble Caps & Risers
2529	Reactors with "Canned" Motor Drives	2912	Steel Drums	2748	Electric Motor	2815	Polyethylene Drums	2887	Flowmeters
2530	Paper Splicing Machine	2913	Liquid Blending System	2749	Protective Coating	2816	Diammonium Phosphate	2888a	Industrial Chemicals
2531	Controlled-volume Pump	2914	Shadograph Scale	2750	Drain Valves	2817	Acrylic Esters	2888b	Agricultural Chemicals
2532	Heat Exchanger	2915	Rotary Coder	2751	Vibrating Separators	2818	Preservatives	2889	Structural Polyethylene
2533	Mist Eliminator	2916	Bag Closing Machine	2752	Swivel Joints	2819	Thermo Conducting Cements		
2534	Horizontal Pressure Filters	2917	Polyethylene Liner (state use)	2753	Packings and Gaskets	2820	Impact Mill	2890	Gas Analyzer
2535a	Grinding Machine	2918	Dust Filter & Collector	2754a	Plug Valve	2821	Electrical Meters	2891	Copper-base Alloys
2535b	Dry-batch Mixer	2919	Barrel & Drum Packer	2754b	Line Blind Valve	2822	Infrared Film	2892	Casters and Wheels
2536	Pulverizers (state requirement)	2920a	Breakers	2755	Variable-speed Drive	2823	Zinc Point	2893	Screw Conveyor Heat Exchanger
2537	Continuous Contact Column	2920b	Crushers	2756	Glass Shell & Tube Heat Exchanger	2824	PVC Fittings & Flanges	2894	Self-priming Centrifugal Pump
2538	Spray Nozzles	2920c	Exhausters	2757	Chemical Compound	2825	Molybdenum Disulfide Lubricant	2895	Tubular Conveyor
2539	Filters	2920d	Fiberizers	2758	Vinyl Plastic Dispensers	2826	Sampling Valves	2896	Heavy Duty Paint
2540	Rotary Dryers	2920e	Granulators	2759	Impulse Steam Trap	2827	Two-stage Pumps	2897	Shut-off Valve
2541a	Bronze Valves	2920f	Attrition Mills	2760a	Gate Valves	2828	Worm Gear Drive	2898	Solenoid Valve
2541b	Piping Layout	2920g	Laboratory Mills	2760b	"How to Protect Your Valves"	2829	Low Temperature Cabinet	2899	Purge Meter
2542	Horizontal Rotary Filters	2920h	Separators	2761	Variable-speed Pulley	2830	Welding Copper	2900	Time Recorder-Totalizer
2543	Dispenser (state application)	2920i	Texturizers	2762	Portable Electric Drum Warmer	2831	Flexible Coupling	2901	Activator, Charcoal
2544	Filter Press Closer	2920j	Container Printer	2763	Pipe Joint Compound	2832	Material Valve	2902	Industrial Aromatics & Chemicals
2545	Heating System	2921	Aerosol Pack	2764	Pump Motor	2833	Vertical Turbine Pumps	2903	Foundry Castings
2546	Dust Control in Rubber Industry	2922	Fiber Cans	2765	Custom Plastic Extrusion	2834	High-alloy Castings	2904	Lubricants
2547	Centrifugal Separators	2923	Liquid Meters	2766	Cellular Glass Insulation	2835	Potassium Hydroxide Mixers	2905a	Homogenizers
2548	Sectional Heat Exchangers	2924	Cleaner	2767a	Stainless Pipe Fittings	2836	Wire-mesh Separators	2905b	Colloid Mills
2549	Mixers	2925	Tape Dispenser	2767b	Flange Slide Rule	2837	Blue Pigment for Vinyls	2906	Teflon Packings
2550	Vibrating Screen Separators	2926	Carton Unloader	2768	Portable Electric Generator	2838	Filter Aids	2907	Industrial Storage Bins
2551	Absorption Refrigeration Machine	2927	Valve Bag Packer	2769	Thread Lubricant	2839	Soda Ash	2908	Concrete Floor Patch
2552	Hydraulic Closing Device	2928a	Fluid Agitator	2770	Canned Motor Pumps	2840	Magnetic Separator	2909a	Rotary Mechanical Seals
2553	Refractory Grain	2928b	Agitator Drives	2771	Transformer Breather Valve	2841	Epoxy Resins	2909b	Laboratory Mixers
2554	Steam Jet Ejectors	2929	Fans	2772	Port Valves	2842	Sink Trap	2909c	Top-entering Turbine & Paddle-type Mixers
2555a	Electric Heaters	2930	Steam Traps	2773	Snubbers	2843	Stainless Pump	2909d	Top-entering Propeller-type Mixers
2555b	Applications of Electric Heat	2931	Gaskets & Packings	2774	Flange-mounted Motors	2844	Alkyd Molding Compounds	2909e	Side-entering Mixers
2556	Graphite Heat Exchanger	2932	Wire Cloth & Fabrication	2775	Globe Valves	2845	Forged Steel Valves	2909f	Mixing Data Sheet
2557	Packaged Pilot Plant	2933	Heat Transfer Oil	2776	Sample Crushers	2846	Chromatographic Aluminas	2909g	Portable Electric & Air-driven Mixers
2558	Self-cleaning Filter	2934	Heat Transfer System	2777	Concrete Storage Bin	2847	Anion Resins	2909h	Mixing Equipment Line
2559	Applications of Aluminum	2935	Glass-lined Vessel	2778	Pipe and Tube Removal Tool	2848	Heat Exchangers and Condensers		
2560a	Filter	2936	Vinyl Tube	2779	Vinyl Surface Coating	2849	Tank Storage Data	2910a	Phenol
2560b	Utility Filter	2937	Horizontal Pumps	2780	Mechanical Seal	2850	Heating Elements	2910b	Phthalic Anhydride
2560c	Disc Filter	2938	Vertical Pumps	2781	Steam Traps	2851	Aluminizing	2910c	Pentacrythritol
2560d	Asbestos Filter Sheets	2939	Air Cylinder Control Valve	2782	Metal Grating	2852	Stainless Steel Wire	2910d	Plasticizers
2561	Vacuum Pump	2940	Flexible Hose	2783	Indicating Breathers	2853	Lubricants for Plug Valves	2910e	Formaldehyde
2562	Silicate Stone Sinks	2941	Non-lubricating Carbon Packing	2784	Pillow Blocks	2854	Vacuum Pump	2910f	Glycerine
2563	Spectromet	2942	Process Equipment Fabrication	2785	Corrosion-resistant Plastic Pumps, Valves, Fittings	2855	Dust Control	2910g	Maleic Anhydride
2564	Research Laboratory Equipment (state which)	2943	Stainless Light-wall Tubing	2786	Rotary Pressure Joint	2856	Ray-ducer Mill	2910h	Sodium Sulfite
		2944	Metal Cutting Tool			2857	Gamma Ray Projectors	2910i	Pentachlorophenol
		2945	Aluminum Tool Bits						
		2946	Water Strainers						

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THAT'S INTERESTING

(Continued from page 2)



"Hard tack, flour, salt, scintillometer —"

Prospectors hunt gold with pick, pan, and scintillometer

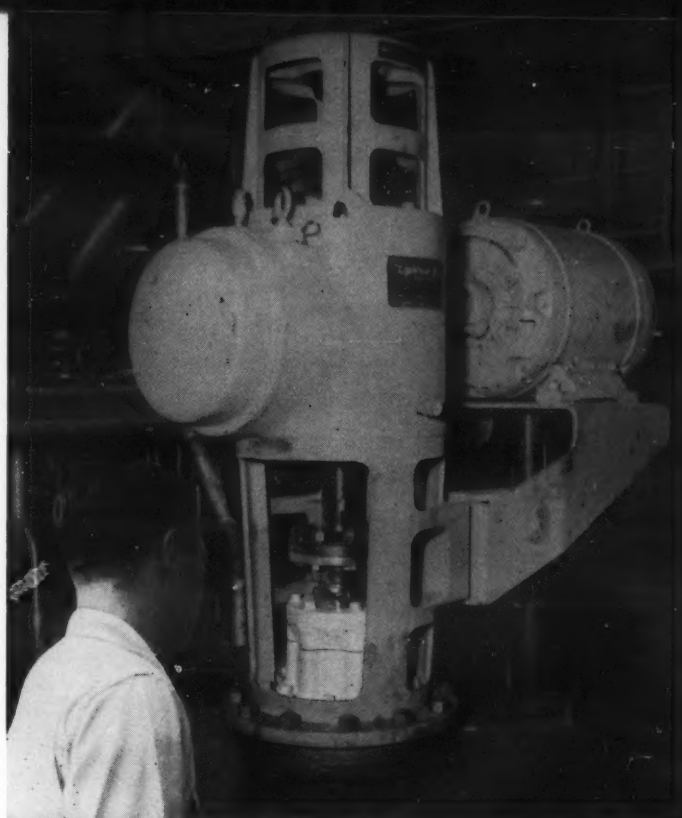
Since minute traces of uranium are sometimes associated in nature with deposits of gold, silver, lead, zinc, tin, copper, nickel, and bismuth, prospectors use uranium as a spotting agent for locating valuable non-radioactive minerals. A scintillometer mainly used for ferreting out uranium is now becoming invaluable for gold.

To put the shoe on the other foot, recovery plants are now in operation to collect the uranium present in tailings from gold mines. Profits from uranium production may eventually equal profits from gold.

Listening skills tuned up

The art of listening, long abused in man's communication efforts, is being taught to 100 employees of Minneapolis-Honeywell in Philadelphia. In this world of words, it is estimated that 70% of our time is devoted to communication . . . of that time, 45% is spent listening, 35% talking, and the rest in reading and writing. Trouble is, most people only half-listen — so the Honeywell students are learning to concentrate on listening. There are women taking the course, too!!

For more information on product at right, specify CP 2909 . . . see information request blank opposite last page.



Newest cost-saver for fluid mixing:

End stuffing box repacking . . . forever with a rotary seal that's easy to replace

You may get a whole new concept of the ease of mixing fluids under pressure or vacuum, when you read this story.

For here is a rotary seal that gives you leakproof, low-maintenance fluid mixing for years, under most conditions.

Yet anyone can replace this seal in a few minutes, if necessary. Without dismantling or demounting the mixer. Without draining the tank. And without special skill.

Here's what you gain when you specify LIGHTNIN Mixers with new LIGHTNIN Seals:

1. You end leakage—for good. The seal

positively will not leak during its operating life. You can get standard LIGHTNIN Seal assemblies to handle pressures as high as 1200 psig; temperatures from -120°F . to $+485^{\circ}\text{F}$. Special designs are available for more extreme conditions.

2. You eliminate the cost of repacking stuffing boxes. The LIGHTNIN Seal takes the place of a stuffing box. Under most conditions, it runs for years without changing.

3. You stop costly "nursing" of stuffing boxes. The seal never needs adjustment.

4. You can replace a LIGHTNIN Seal in a

few minutes, should it ever become necessary. Only one cartridge component to unbolt and replace—and you're back in operation. Anyone who can handle a wrench can do it.

Already, many chemical processors are using LIGHTNIN Seals.

Users report maintenance savings running into many thousands of dollars yearly.

Your LIGHTNIN Mixer representative can give you the full story—show you how much you can save. Call him today. Or get the facts by mail: Send the coupon for 8-page, fully illustrated bulletin.

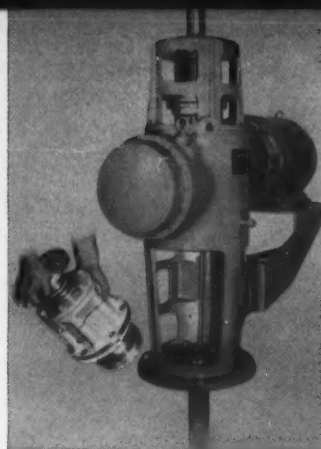
You are cordially invited to visit Mixco Booth 800 at the Chemical Show, Philadelphia, December 5-9.

Get the cost-cutting facts now... New 8-page Bulletin B-111 shows how you get maintenance-free sealing that really slashes fluid mixing cost to a new low. Send also for LIGHTNIN Mixer catalogs listed here. Free—no obligation. Just check data you want, tear out and mail to us today with your name and company address.

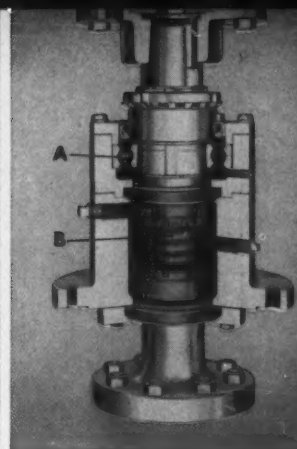
- ☐ B-111 LIGHTNIN Rotary Mechanical Seals
- ☐ DH-50 and DH-51 Laboratory Mixers
- ☐ B-102 Top Entering Mixers (turbine and paddle types)
- ☐ B-103 Top Entering Mixers (propeller types)

- ☐ B-104 Side Entering Mixers
- ☐ B-107 Mixing Data Sheet
- ☐ B-108 Portable Mixers (electric and air driven)
- ☐ B-109 Condensed Catalog (complete line)

MIXING EQUIPMENT Co., Inc., 185-n Mt. Read Blvd., Rochester 11, N. Y.
In Canada: Greey Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 10, Ont.



IF YOU CAN USE A WRENCH, you can replace a LIGHTNIN rotary seal in a few minutes. The mixer stays in the tank. Just unbolt and lift out this one-piece cartridge assembly; bolt a new one in its place; you're back in operation.



SMOOTH RUNNING. Prelubricated mixer shaft bearing (A) is part of seal assembly, close to seal for proper shaft support. But seal lubricant chamber (B) is separate from bearing—so you can choose best seal lubricant for your needs, without regard to bearing lubricant. Seal is stocked in wide range of designs and corrosion-resistant materials.

NEW LOOK in fluid mixing. This seal cartridge takes the place of a stuffing box; runs for years without adjustment; handles pressures to 1200 psig, temperatures from -120°F . to $+485^{\circ}\text{F}$. Seals are optional equipment on LIGHTNIN top entering, side entering, and bottom entering mixers.

**Lightnin®
Mixers**

MIXCO fluid mixing specialists



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